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ABSTRACT

This report evaluates the implementation of the "Long-Range Magnet School Plan" at Southwest High School, a mathematics and science magnet school in Kansas City, Missouri. The evaluation covers the academic years from 1988-89 through 1990-91. After an executive summary and an introduction that describes the program, the report is presented in five sections. The first section reports enrollment and racial composition data of the school by grade in order to examine enrollment trends prior to and during the program. The second section describes the implementation of the program, and includes information about student transportation, renovation of school facilities, provision of instructional supplies and equipment, staffing, the transition period to facilitate student adjustment, and the science and mathematics focus on a problem-solving learning environment. The third section presents data collected during weekly classroom observations of randomly selected classes. Data indicated a progressive increase in problem-solving activities in the classroom, little progress in infusing mathematics and science across the curriculum, an increased use of in total group instruction, low implementation of experimentation and statistics activities, and a substantial increase in hands-on learning activities. The fourth section reports the perceptions of the teachers, students, and parents towards the program. The fifth section reports the mathematics, science, and reading achievement ratings of Southwest students and compares them to the district for the following tests: Tests of Achievement and Proficiency (TAP); the Missouri Mastery and Achievement Test; and the Degrees of Reading Power. TAP achievement scores were found to be below district and national norms in reading, writing expression, science, and mathematics at all grade levels, with the exception of the mathematics achievement of grade eleven. The following recommendations are included: (1) continue efforts to staff vacant magnet-related resource and teacher positions; (2) increase security and safety at Southwest; (3) increase communication between school and program participants; (4) explore teachers' perceptions that their students are not making academic progress; and (5) consider increasing the instructional emphasis upon reading and written expression skills. (MDH)

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Summative Evaluation of the Southwest Science and Mathematics Magnet High School

1988-1989
1989-1990
1990-1991

Evaluation Office

The School District of
Kansas City, Missouri

August 1991

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Summative Evaluation of the Southwest Science and Mathematics Magnet High School

1988-1989
1989-1990
1990-1991

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August 1991

Evaluation Office
Desegregation Planning Department
The School District of Kansas City, Missouri

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Executive Summary

The Southwest Science/Math Magnet High School has completed its third year of operation as part of the Kansas City, Missouri School District's *Long-Range Magnet School Plan*. This summative evaluation report documents the progress made by the Southwest during the three years of implementing the science/math theme. The evaluation was, in part, based on the program goals and objectives as outlined in the *Long-Range Magnet School Plan* and the *Southwest Science/Math Magnet High School Planning Outline*.

The results of this evaluation indicate that Southwest had made moderate progress toward desegregation in the first two years of implementation. However, in the third year, the racial composition of the school was similar to that found in the year prior to magnet program implementation. Program capacity information indicated that the ninth grade enrollment exceeded capacity by 8%. The infusion of Paseo High School students, reassigned to Southwest while Paseo was razed and during construction of New Paseo, and a substantial portion of other students, who had indicated no preference for a particular magnet theme at enrollment, contributed to the school's resegregation.

Southwest's program implementation has been seriously hindered by the lack of science facilities. Several labs, specialized science libraries, the planetarium and a greenhouse had been under construction/renovation during the first two years of implementation. In the third year all labs and specialized facilities were available for instructional use. While target behaviors such as problem-solving and critical thinking have increased moderately since the first year, most observational indicators suggest that the magnet theme has not yet been completely incorporated into the instructional process. Observational data suggest that there have been low frequencies of 1) theme infusion in non-theme classrooms, 2) experimentation, and 3) the use of statistics, each of which are stated program goals. While not substantially evident in classrooms, experimentation was occurring much more often in laboratory settings. The use of statistics remains low in both classroom and lab settings.

Alternately, observations conducted in computer labs suggest that students are receiving computer instruction and are engaged in learning to use computers. Furthermore, hands-on learning opportunities, in computer, science and math labs, have increased dramatically since the first year of implementation.

TAP achievement scores, at each grade level, in reading and written expression, were found to be below district and national norms. TAP mathematics scores were below district and

national norms, with the exception of grade eleven. TAP science achievement scores were below district and national norms at all grade levels.

A three year cohort group, when tracked across years, was found to have substantially different minority and non-minority student achievement, with non-minority students scoring higher in each of four content areas. Furthermore, in support of the notion that magnet school experience should contribute to equalizing achievement performance among ethnic groups, the cohort trend lines for minority and non-minority students have demonstrated a degree of convergence in theme subjects. However, the trend for reading and written expression suggest divergence between the two groups.

Teacher and student perceptions of their magnet school experience are mixed. While many teachers feel professionally challenged teaching in the program, most teachers are not satisfied with instructional support and leadership within the school. Furthermore, only 40% of the teachers believed their students were making good academic progress in the magnet program. Teachers expressed additional concerns regarding within-school communication and information dissemination. Perceptions suggested that students believed they learned and enjoyed the math component of the theme to an extent greater than the science theme component. The majority of students report not having had the opportunity to design experiments or use statistical procedures in classes. Alternately, most students feel challenged in class, like their classes, and like going to Southwest. Parent perceptions are generally favorable toward the magnet program. Two-thirds of parents believed that the math/science program at Southwest had increased their child's interest in math and/or science. Five recommendations were offered as a result of this summative evaluation.

SUMMATIVE EVALUATION
OF THE
SOUTHWEST SCIENCE AND MATHEMATICS
MAGNET HIGH SCHOOL

1988-1989, 1989-1990, 1990-1991

Introduction

This summative evaluation documents the progress made by the Southwest Science/Math Magnet High School during the three years of implementing a science/mathematics magnet theme. Southwest Science/Math Magnet High School operates in accordance with the *Long-Range Magnet School Plan* (Hale & Levine, 1986), (hereinafter cited as the Long-Range Plan), and the *Southwest Science/Math Magnet High School Planning Outline* (Southwest Science/Mathematics High School Magnet Site Task Force, 1988) established by a magnet task force convened during the planning year of 1987. In keeping with the guidelines of the Long-Range Plan, the planning outline established the structure, objectives, and goals for the science/math program.

During the first year of implementation, Southwest was divided into two separate campuses due to renovation efforts. During the second and third years, Southwest was located on a single campus, serving students in grades 9 through 12.

Given the summative nature of this evaluation, the focus has been upon assessing implementation of the magnet theme and identifying trends related to enrollment, desegregation, and achievement of Southwest High School during the three years of program implementation. This report provides a brief discussion of the science/math magnet program, the design of the evaluation study, and a presentation of the evaluation results. Conclusions and recommendations based upon obtained results are offered with an eye toward improved program functioning.

Program Description

The structure of the magnet program was derived from the Long-Range Plan, a court-approved document which outlines a six-year program to implement the magnet schools in the

Kansas City, Missouri, School District. Additional program specifications are detailed in the *Southwest Science/Math Magnet High School Planning Outline*

The science/math theme is, in part, expressed through the implementation of an expanded curriculum. Courses offered include the full compliment of high school science and math courses as well as special interdisciplinary courses offered at both the regular and advanced ability levels. According to the Long-Range Plan, the Southwest magnet program was developed with the following vision:

The basic science and math curriculum at Southwest will be much more comprehensive than that usually offered at the high school level in Kansas City or elsewhere. For example, the science curriculum should include courses in Advanced Chemistry, Advanced Physics, Anthropology, Astronomy, Botany, Economics, Geology, Geosciences, and Microbiology. The math curriculum should include courses in Calculus, Number Theory, Probability and Statistics, Statistical procedures, and Systems Analysis (Hale & Levine, 1986, p. 87).

The planning outline speaks to an emphasis in the development of skills in critical thinking, problem-solving, experimentation, and statistical analysis for Southwest High School students. According to the Southwest planning outline:

> The mission of Southwest Science/Math Magnet High School is to provide in-depth course offerings in science and mathematics which are current with technological advances. The total program will challenge students to think critically and creatively; to communicate effectively in both oral and written form; and to become problem solvers (Southwest Science/Math Magnet Site Task Force, 1988, p. 1).

In order to accommodate the enhanced curriculum and the development of higher-order cognitive skills, the Long-Range Plan proposes that Southwest provide fully-equipped laboratories. In addition, special facilities such as a greenhouse, a planetarium, and science/math libraries should be available for student use.

With the influence of the science/math theme, the planning outline speaks to the goal of infusing science and mathematics throughout the entire curriculum. Not only are teachers expected to infuse their particular curriculum with math and science, but students should become competent in applying their knowledge of math/science into other course work. The planning outline identifies relevant instructional activities to facilitate the student's acquisition of scientific and research-based skills.

The proposed utilization of computer resources, as well as experience in laboratory procedures, provides for hands-on learning in both mathematics and science. It is proposed in the planning outline that students be given opportunities to design and conduct experiments and to analyze data with statistical procedures in both science and mathematics. Similarly, experimentation and statistical skills are expected to be infused and utilized in other curricular areas.

Evaluation Design

Information provided in this summative evaluation report addresses: 1) program implementation progress, 2) enrollment and desegregation progress toward court-ordered goals, 3) the perceptions and attitudes of program participants toward the Southwest magnet school program, and 4) achievement improvement during the three years of implementation (1989-1991).

This summative evaluation was designed to address the following questions:

1. Has the school met the established enrollment goals?

2. Was the program implemented as detailed in the *Long-Range Magnet School Plan* (Hale & Levine, 1986) and in the planning outline?

3. What are parent, teacher, student, and school leadership perceptions about and attitudes toward the program?

4. What are the levels of student achievement in the school?

Data collection for the current year consisted, in part, of gathering enrollment and racial composition data and achievement data. Enrollment and racial composition data are reported for the year prior to implementation and the three years of implementation. Program implementation was examined through classroom observations, on-site visitations, interviews with school leadership, and administrations of teacher, student and parent questionnaires. Student achievement, as measured by the Tests of Achievement and Proficiency (TAP), Missouri Mastery and Achievement Tests (MMAT), and the Degrees of Reading Power (DRP) test are reported for three years of implementation.

Results

Enrollment Goals

Enrollment and racial composition data have been extracted from the official student membership reports prepared by the research office of the school district. These values are based on enrollment figures reported on the fourth Wednesday in September. Minority and non-minority figures are presented by grade. According to the *September 26, 1990, Student Membership* (Research Office, 1990b) report and program capacities utilized by the district's Admissions Office, Southwest High School was below program capacity at the tenth, eleventh, and twelfth grades. As Table 1 demonstrates, Southwest had 1,186 students enrolled. Utilizing program capacity information for 1990-1991, Southwest has an actual student enrollment meeting 80% of the school's capacity. Additionally, it can be seen from Table 1 that Southwest's actual enrollment figures at the ninth grade exceed program capacity by 8% while grades eleven and twelve were underenrolled by about 35%.

Three years of desegregation data are reported in Table 2. Data for the year prior to program implementation (baseline-1987) were reported in an effort to examine racial composition trends prior to and during program implementation. Desegregation goals for South-

Table 1
Southwest Science/Math Program
Program Capacity and Enrollment
1990-1991

Grade	Program[1] Capacity	Actual[2]	Difference	% of Capacity
9	400	433	+ 33	108%
10	340	286	-54	84%
11	363	229	-134	63%
12	371	238	-133	64%
Total	1474	1186	-288	80%

[1] Program capacity utilized by the Admissions Office when placing students in magnet programs.

[2] From *September 26, 1990 Student Membership* (Research Office, 1990b).

Table 2
Minority & Non-Minority Enrollment for Southwest Science/Math Program by Grade and by Year

	Baseline year: Sept. 1987				Year 1: Sept. 1988				Year 2: Sept. 1989				Year 3: Sept. 1990			
	Minority		Non-Minority		Minority		Non-Minority		Minority		Non-Minority		Minority		Non-Minority	
Grade	N	% of Total	N	% of Total	N	% of Total	N	% of Total	N	% of Total	N	% of Total	N	% of Total	N	% of Total
9	203	80%	51	20%	167	81%	39	19%	171	78%	49	22%	370	85%	63	15%
10	248	87%	37	13%	128	81%	31	19%	155	78%	43	22%	239	84%	47	16%
11	256	82%	58	18%	203	85%	35	15%	127	78%	35	22%	189	83%	40	17%
12	204	81%	49	19%	173	78%	50	22%	153	82%	33	18%	204	86%	34	14%
Total	911	82%	195	18%	671	81%	155	19%	606	79%	160	21%	1002	84%	184	16%

Note: Percentages are rounded to the nearest whole percent. 1987 enrollment figures are computed by subtracting students in self-contained special education progrms, reported in the *Senior High Membership in Special Education* (Research Office, September 1987a), from total enrollment figures, reported in *A By-School Comparison of Student Enrollment by Race & Grade for the Years 1986-87 & 1987-88* (Research Office, 1987b); 1988 enrollment figures are from *September 28, 1988, Student Membership* (Research Office, 1988b); 1989 enrollment figures are from *September 27, 1989, Student Membership* (Research Office, 1989b); 1990 enrollment figures are from *September 26, 1990 Student Membership* (Research Office, 1990).

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west require annual enrollment modifications of at least 2% toward a 60%/40% minority/non-minority ratio. According to figures reported in the *September 26, 1990, Student Membership* report (Research Office, 1990b), total school minority/non-minority enrollment for 1990-1991 was at 84% minority/16% non-minority, a decrease from the previous year in non-minority enrollment of 5%. Furthermore, each grade level had a minority enrollment exceeding 80%. While improvement had been seen during the first and second years of implementation, third year racial composition, at each grade level, resembles that of the year prior to implementation. According to school leadership, the significant departure from improving desegregation at Southwest was brought about by the transfer of Paseo High School students and the enrollment of contingency students who had not expressed an interest in attending Southwest. Paseo had a 99.2% minority enrollment according to the *January 31, 1990, Student Membership* (Research Office, 1990a).

Implementation

The following section presents information relative to the historical functioning of selected aspects of the science/math magnet program at Southwest.

Transportation. According to school leadership, during the first year of program implementation student transportation was a persistent problem. Leadership reported that late arrivals and departures contributed significantly to problems with program implementation. School leadership reported in the second year of implementation that problems with transportation continued during the early days of the fall term. Leadership reported that two suburban students withdrew from Southwest in the second year of implementation, chiefly because of a lack of reliable transportation to and from school. During the first two weeks of the third year, school leadership indicated that transportation problems still existed. However, by mid-October, transportation was satisfactory.

Renovation. The full implementation of Southwest's science/math magnet program, as stated in the Long-Range Plan, was impeded during the first two years by ongoing renovation efforts. School leadership has indicated that construction and renovation efforts are complete.

However, according to school leadership, the physical plant has some shortcomings. Leadership believes that the auditorium and band room should be air-conditioned. Further, in order to move telescopes safely from inside to outside for night viewing, an elevator in the science wing is needed. Leadership did note however that the renovation and construction, as designed, was complete and functional. The planetarium and greenhouse vivariums were

completed in the spring of year two. However, they were not available for use until the beginning of the third year. Science and mathematics library volumes were housed in a section of the main library. Facilities proposed for use in the Severely Handicapped Science Pilot Project, such as a special science library and lab facility for handicapped students, were being utilized as regular student classrooms, during the second year, due to space limitations imposed during renovation. The third year of implementation saw the handicapped students placed in their specially designed classroom and lab.

The industrial technology complex is in operation with most drafting equipment in place. Computer systems are on-line in the drafting room. The complex consisted of a drafting section and what appeared to be a traditional wood shop. Informal walk-throughs of this area of Southwest did not suggest substantial utilization of drafting computers. Furthermore, the availability of raw materials in the wood shop seemed minimal.

Renovation of the proposed area designated for computer instruction was completed during the second year of implementation. Four computer classrooms/labs were in operation during the third year. Three of the four rooms were being utilized as computer classrooms and one room as a computer resource lab. The most critical physical plant features such as the planetarium, greenhouse, science lab, and science/math library were not available for student or staff use during the first or second year of implementation. However, at school start-up in year three all of these specialized theme-related resources were available for instructional use.

Supplies and equipment. During the first year of implementation, the processing and delivery of requisitions was problematic. As a result, an end-of-year recommendation was made in the formative evaluation to "keep consistent records of requisitions and delivery of materials ordered" (Clay, 1989b, p. 25), which has since been implemented. However, at the end of the second year, school leadership indicated that he was "still very concerned with requisitions". He stated that the bulk of the order to procure microscopes had not arrived as well as $140,000 in computers. Of the lab equipment delivered, he was satisfied, yet as mentioned above, the labs were not available to students during the second year and although much has been completed, critical materials and supplies were lacking for many lab facilities. For example, two telescopes for the planetarium were ordered; as of May, 1990 only one had been delivered.

At the mid-year point of year three, school leadership indicated that textbooks were delivered in time for school start-up. However, other supplies were still lacking. Leadership

believes that requistions are not processed in a timely manner at the central office. When asked the status of theme-related supplies and materials, including science equipment, telescopes, and other specialized equipment, leadership indicated that all necessary instructional materials were available for instructional use.

Staffing. At the beginning of the 1990-1991 implementation year, school leadership at Southwest reported two magnet-related staff vacancies (math teacher and a science transition teacher) existed. When asked again in April if additional magnet-related vacancies had occurred, school leadership indicated that the science librarian, science resource teacher, and computer resource teacher positions were vacant.

Five resource teachers were proposed in the Southwest planning outline to assist in the implementation of the magnet theme (p. 18). According to the planning outline, resource teachers provide resources and assistance to classroom teachers in their efforts to implement the magnet theme. Assistance may include such activities as conducting demonstrations, doing prognostic testing, coordinating math/science related field trips, identifying guest speakers, providing curricular and instructional guidance, and planning specific curricular components. The lack of almost one-half of the resource staff is a serious shortcoming of the math/science implementation. The staffing situation at Southwest poses a hinderance to future program functioning, given these critical theme-related vacancies.

Transition programs. According to the Long-Range Plan, each middle and senior magnet high school is to have a transition program to facilitate the adjustment of students who are having difficulty, academically or behaviorally, in the magnet theme. Students are pulled-out of their regular schedule to be instructed on a semi-individual basis by transition teachers. Two teachers are assigned to the transition program, although five positions were called for in the Southwest planning outline (p. 18). According to the teachers' schedules, a transition teacher may instruct students in a variety of subjects (e.g., General Math, Basic Algebra, Algebra, Geometry). Students are served in the program for varying lengths of time dependent upon student needs and the judgment of the transition teacher. During the third year of implementation, reports from transition teachers indicated that 794 students were served from September to May. This figure represents the cumulative number of students served and may reflect multiple visits by students.

In addition to the regular student transition program mentioned above, Southwest serves handicapped students who may need transition assistance. One regular classroom teacher and

two transition teachers provide instruction. According to staff in the Exceptional Pupil Services district office:

> The purpose of the program is to improve preparation of seriously handicapped students for participation in the magnet school theme. A combination of two rooms are used for self-contained learning disabled students; one will be a transition room and the other will be the science pilot project room. The science pilot room will be larger than a regular classroom. It will be used to promote math and science themes. It will be designed so students can work individually or in small groups and have enough spacing so students can work on a variety of projects.

As mentioned in the discussion of renovations, this facility was not available until the third year of implementation. Disabled students received instruction in a temporary classroom. The program had one class of 10 students receiving services. Ninth grade students were selected for the program during the 1988-1989 implementation year. These students have now completed their third year of participation with no new students having been added to the program. A report from the project teachers indicated that approximately one-third of the students made the honor roll and greater than 40% attended school more than 95% of the scheduled days. For a more complete listing of the instructional activities offered in the program see Appendix A.

Science and math aspects. The focus upon science and math at Southwest suggests a deductive, problem-solving learning environment. Southwest proposes to provide learning opportunities to develop and stimulate inquiry, problem solving and critical thinking. During the three years of implementation, Southwest offered science and math classes beyond the regular grade level courses, science and math related field trips, special activities, and contests.

Science/math curriculum. Several new courses related to the magnet theme were introduced into the curriculum during the first year of implementation (aerospace, botany, computer applications, earth science, health). During the second year, curricular changes included a restructured Biology and Advanced Biology offering, and the addition of Basic Geometry (6 sections). In addition to these new courses, advanced placement courses were instituted in calculus, chemistry, and English.

According to the Long-Range Plan as cited on page two of this report, the magnet science and math curriculum should offer a number of specific courses. Of those mentioned, many have yet to be implemented. According to a school leadership representative, courses in

advanced physics and microbiology, although strongly noted as important offerings in the Long-Range Plan, have yet to be available to students. The Long-Range Plan indicates specific math courses as highly desirable. For example, a course in probability and statistics was added to the curriculum in 1990-1991. Southwest does offer courses in logic, anatomy, biology, and aerospace science as additional advanced level choices. School leadership implemented a new curricular offering in the fall of 1990-1991 with instruction in Scientific Instrumentation. This course proposes to provide students an opportunity to develop and produce scientific instruments for use in the school's labs.

District leadership, in a mid-year interview, indicated concern with the breadth and depth of the curricular offerings, especially in science and math, at Southwest. Leadership indicated a need to examine and possibly modify the existing curriculum to more fully express the diversity of the fields of science and mathematics.

Special activities. In addition to regular curricular offerings, students have been provided opportunities to experience a variety of science and math related field trips, special activities, and contests. During the past three years of implementation, students at Southwest have participated in the Science Olympiad, Knowledge Bowl, and the Chemathon. Students have taken trips to Powell Gardens, the Severe Weather Center, Truman Library, Wildwood Outdoor Education Center and Kansas City Power and Light. They have participated in the National Honor Society Math Exam, the Junior Science, Engineering, and Humanities Exam, and district computer and math contests. For a complete listing of 1990-1991 theme related activities, contests, and field trips see Appendix C.

One particular aspect of the science/math program was not available during the second year. According to the Long-Range Plan (p. 87), "internships for fields related to science and math will be available for students interested in or intending to enter these fields after high school." According to school leadership, this activity was offered in the first year of implementation but not offered during the second year. In the third year, leadership reported that two students had been recommended by staff for summer internships with Allied Signal as research apprentices.

Observational Data

During the period spanning October through April, classroom observations were conducted weekly in three randomly selected classrooms: math or science, English or social studies, and an other classroom such as elective classes (e.g., physical education, art, music).

Each classroom visit lasted for twenty minutes, with each minute being a separate observation interval. Data regarding the occurrence of the following were gathered: problem solving activities, infusion of math and science into areas of the curriculum, use of computers, opportunity to develop and conduct experiments, and utilization of statistical techniques as a scientific and mathematical tool. Additionally, one visit was made to each classroom and throughout the building to document physical evidence of the science/math theme. Laboratory observations were conducted to document opportunities for active hands-on learning. Twelve hundred twenty minutes of classroom observation were completed for this summative report.

Cognitive skills and activities. Table 3 presents the results of classroom observations during the 1990-1991 school year and the first two years of implementation. Initially, the reader is directed to the results for 'Cognitive Skills and Activities.' The most significant finding of the observations was that for problem solving/critical thinking. Twenty percent of the observation intervals found problem solving/critical thinking occurring. This is an increase of 5% from the first year of implementation and a slight decline from the previous year. Additionally, 88% of all observation intervals found students actively engaged in academic pursuits ('Other Academic' and 'Problem Solving/Critical Thinking' summed).

When these classroom activities were examined by curricular area, substantial differences were found for problem solving/critical thinking (see Figure 1). Problem solving activities were observed in 49% of the observation intervals conducted in science and math classes. This was in contrast to English and social studies classes where 21% of the intervals had evidence. Science and math classes were also exposed to more presentations and lectures, as compared to English and social studies classes and elective (other classes). A particularly salient finding was that for the extent of student engagement in silent work. As can be seen in Figure 1, science and math classes were observed to be less likely to be involved in silent work, as compared to English and social studies classes and electives.

When problem solving observational data were examined during the three years of program implementation an important trend emerged. As can be seen in Figure 2, math and science classes and English and social studies classes have had increasing evidence of problem solving since the first year of implementation. Observation intervals with problem solving evidence have more than doubled in math and science classes and more than tripled in English and social studies classes. Alternately, in non-theme other classes, problem solving has steadily declined from 18% to 10% of the observation intervals.

Table 3
Southwest Science/Math Program
Observation Results
Percent of Observation Intervals with Evidence

Areas Observed	1988-1989 (N= 920)	1989-1990 (N= 1181)	1990-1991 (N= 1220)
Cognitive Skills and Activities			
Problem Solving/Critical Thinking[1]	15%	23%	20%
Other Academic (includes below)[2, 3]	74%	68%	68%
Listening to Presentation	--	--	33%
Silent Reading	--	--	1%
Silent Worksheets	--	--	14%
Hands-On Learning	--	--	11%
Classroom Management (includes below)[2, 4]	9%	7%	10%
Behavior Disruption	--	--	2%
Roll/Attendance	--	--	1%
Materials	--	--	1%
Organizational Activities	--	--	6%
Interruption	1%	1%	2%
Other	3%	0%	0%
Total	102%	99%	100%
Math/Science Infusion			
Occurring	12%	7%	8%
Not Occurring	88%	93%	92%
Core Infusion[5, 6]			
Occurring	--	--	4%
Not Occurring	--	--	96%
Experimentation			
Experimentation Evident	2%	1%	4%
Experimentation not Evident	98%	99%	96%
Use of Statistics[6]			
Evident	3%	4%	3%
Not Evident	97%	96%	96%

Note: Percentages have been rounded to the nearest percent.

[1] 1988-1989, and 1989-1990 Problem Solving/Critical Thinking reported percentage includes occurences of Silent Work or worksheets which required problem solving skills. Fall 1990-1991 figures report Silent Worksheets as a separate sub-category subsumed in Other Academic percentages.
[2] In 1988-1989, and 1989-1990 this activity was not examined in sub categories.
[3] 1991 Other Academic activities percentage reported reflects the sum of percents for Lecture, Silent Reading, Silent Worksheets, Hands-On Learning, and academic pursuits not reflected in these categories.
[4] 1991 Classroom Management reported percentages reflect the sum of percents for Behavior Disruption, Roll/Attendance, Materials (distributing, collecting), and Organizational Activities.
[5] This activity not observed in 1988-1989 or 1989-1990.
[6] Based on 480 observation intervals in theme classrooms.

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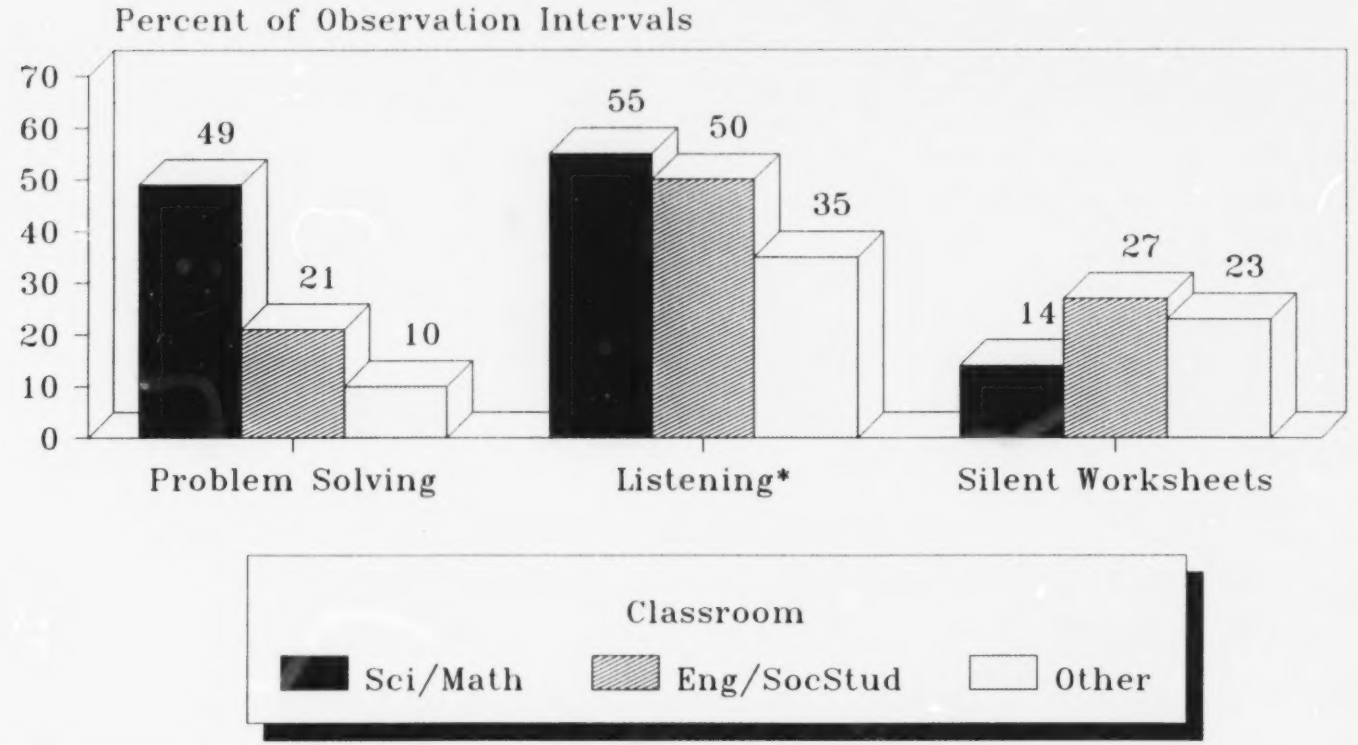
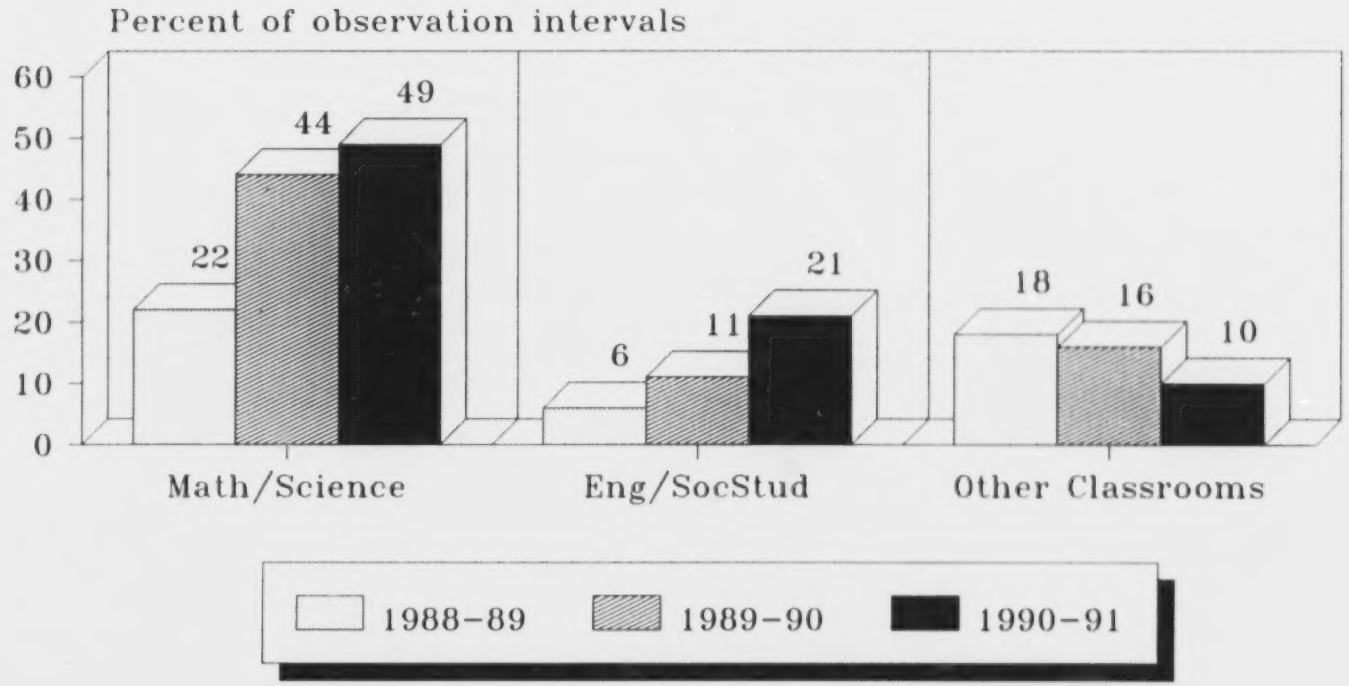
Figure 1
Classroom Activities by Curriculum



Note: * Listening to Presentation.
Based on 1220 observation intervals.
Percentages are rounded.

Figure 2
Problem-Solving Activities by Curriculum



Figures reported are rounded to the nearest whole percent. Based on 1220 observation intervals.

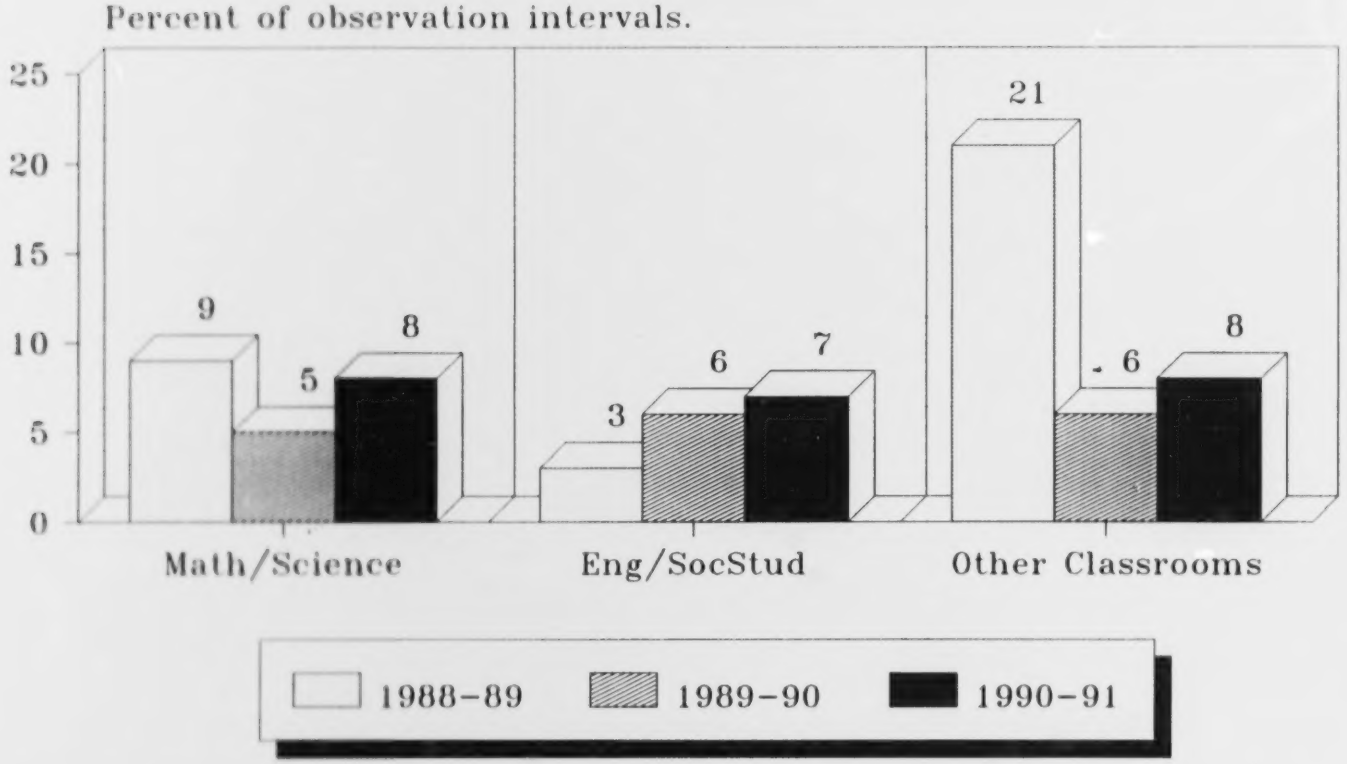
Theme infusion. The planning outline for Southwest reflects an emphasis upon the infusion of science and math in all subject areas. Table 3 indicates that infusion was found in 8% of the observation intervals, down 4% from the first year of implementation. When science/math infusion was examined by curricular area (see Figure 3), it was found that infusion occurred in science and math classrooms (science teacher infusing math or math teacher infusing science) as frequently as it did in English/social studies and other classrooms.

The trend of infusion activity, since the first year of implementation, suggests a relatively static degree of infusion in math and science classrooms. Infusion in English and social studies classes has been moderately increasing since year one, more than doubling since program implementation began. Alternately, after establishing a high rate of infusion in the first year, electives and other classes have evidenced substantially less infusion. Virtually all classes examined are infusing the theme at similar rates.

Instructional grouping strategies. When instructional grouping (working groups,) was examined during the three years of program implementation, results suggested that total group work dominated the structure of classroom instructional groupings (see Figure 4). Furthermore, total group instruction has steadily increased during the three years. Concurrently, individual work (individualized) has consistently decreased during the three years. Small group work, a central feature of cooperative learning and team-oriented inquiry, has remained relatively unchanged.

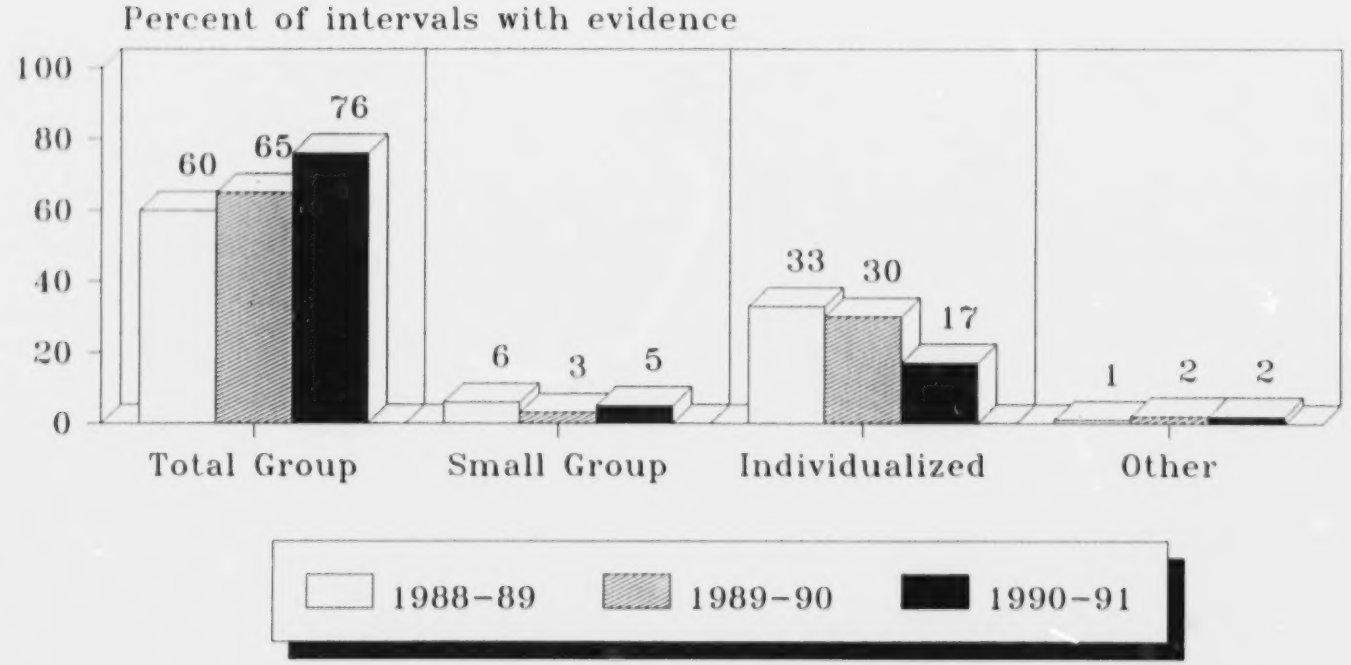
Experimentation and statistics. During 1,220 minutes of observation, teacher efforts to incorporate experiments and provide opportunities for students to utilize statistical methods were minimal (see Table 3). Only 4% of the observation intervals had evidence of experimentation and 3% had evidence of the use of statistics. Across the three years of program implementation, evidence of experimentation and statistics has remained relatively low. While improvement has been found in experimentation, the use of statistics in the classroom has not changed. These figures have elicited evaluation recommendations in both years one and two to increase opportunities for students to utilize statistics and participate in experimentation. At the end of the third year of implementation, leadership was asked to rate the progress of the program toward meeting the goal of providing students with opportunities for statistics use and for experimentation. On a scale of A to F, with A= excellent and F= failed to meet the goal, school leadership rated experimentation with a D (below average) and statistics use as an 'E' (somewhere between below average and failed).

Figure 3
Infusion Activity by Curriculum



Figures reported are rounded to the nearest whole percent. Based on 1220 observation intervals.

Figure 4
Instructional Grouping Strategies: Utilization across time



Figures are rounded to the nearest whole percent. Based upon 1220 observation intervals.

Teachers were queried, with a questionnaire, as to whether they had received information from resource support which would help them to infuse experimentation and statistics into their instructional efforts. More than 50% of responding teachers indicated that they had received assistance (see Table 6; items 9 and 10).

Hands-on learning. During the first two years of implementation, Southwest was without proposed science laboratory facilities. According to school leadership, these facilities became available to staff and students during the fall term of the 1990-1991 year. However, some science equipment was being used in science classrooms. In an effort to observe the degree to which the use of science equipment, math manipulatives, and computers were being utilized, weekly visits were made to science laboratories, math classrooms and computer labs. Table 4

Table 4
Southwest Science/Math Program
Hands-On Use of Math Manipulatives,
Science Equipment, & Computers

	1988-1989		1989-1990		1990-1991	
Areas Observed	N[1]	%	N[2]	%	N[3]	%
Math Classes						
Hands-On Occurring	---	---	26	24%	86	49%
Manipulatives Visible but not being used	---	---	---	---	7	4%
Hands-On Not Occurring	81	100%	84	76%	82	47%
Total	81	100%	110	100%	175	100%
Science Classes						
Hands-On Occurring	3	5%	12	13%	71	42%
Equipment Visible but Not being Used	---	---	---	---	8	5%
Hands-On Not Occurring	55	95%	78	86%	89	53%
Total	58	100%	91	99%	168	100%
Computer Labs or Resource Room						
Using Computers	26	70%	37	97%	45	94%
Not Using Computers	11	30%	1	3%	3	6%
Total	37	100%	38	100%	48	100%

Note: Percentages are rounded to the nearest whole percent.

[1] In all, 303 visits were made to math, science, and computer rooms, in 127 (42%) of the visits, no students were present or students were transitioning (just arriving or preparing to leave). These cases are not included in the data.

[2] In all, 323 visits were made to math, science, and computer rooms. In 84 (26%) of the visits, no students were present. These cases are not included in the data.

[3] In all, 465 visits were made to math, science, and computer rooms. In 74 (16%) of the visits, no students were present. These cases are not included in the data.

and Figure 5 portray the results of observations made during the three years of implementation.

Overall, it can be seen that science and math classes were not receiving significant opportunities to utilize hands-on manipulatives/equipment during the first two years. However, in the third year, during 168 visits to science labs, 42% found hands-on learning activities. Similarly, in 175 visits to math classes, 49% of the visits found hands-on learning occurring. Similarly, computer labs consistently have offered hands-on learning on the computers. Second and third year observation visits found hands-on learning occurring during more than 90% of the visits (see Figure 5).

These figures seem to suggest that the Southwest program, with the completion of all labs, has had substantial increases in hands-on learning for science, math, and computer instructional activities.

Physical evidence of the theme. In December, 1990, one visit was made to Southwest to document the extent of physical evidence of the magnet theme. Eighty-six locations within the building, including classrooms, were observed (see Table 5). Observers noted such items as: student work, plants, animals, science models, charts, posters, equipment, manipulatives, graphs, and pictures. Across all classrooms, with the exception of math rooms, 12% had

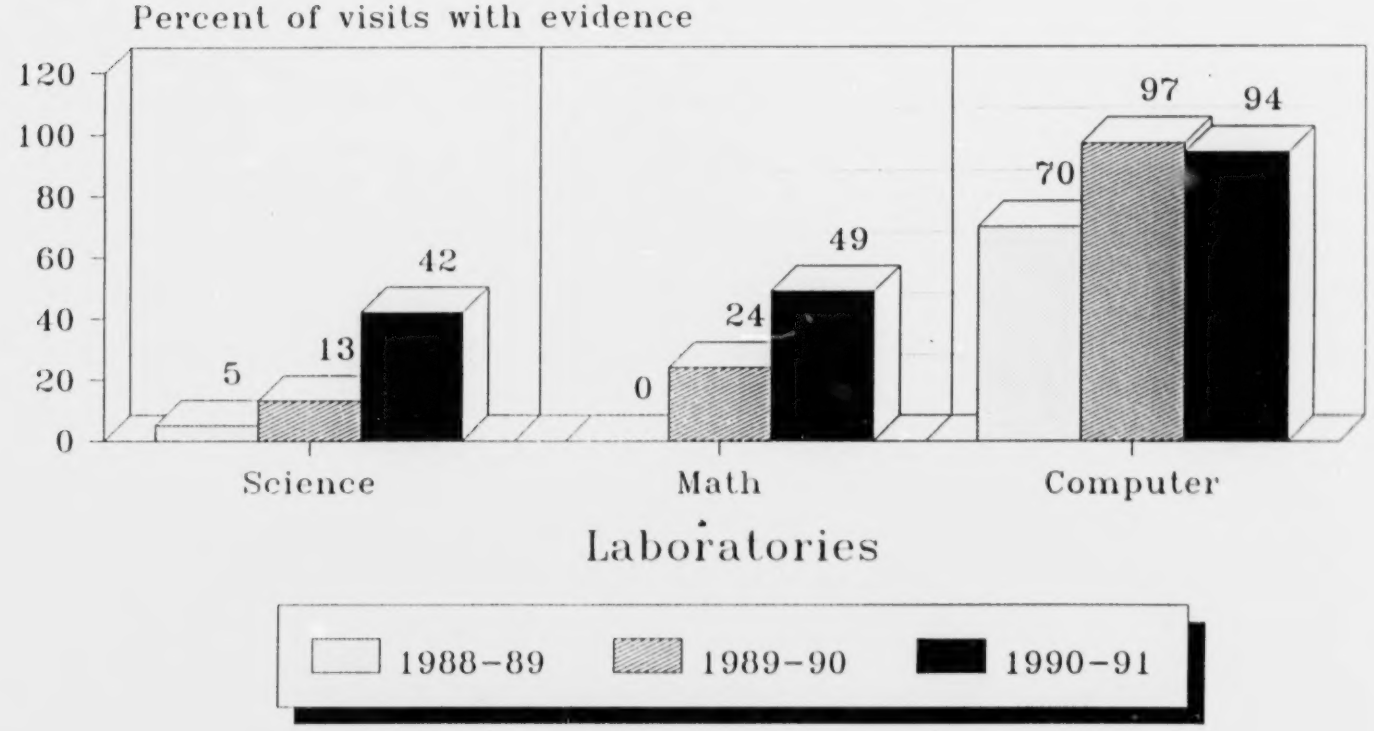
Table 5
Southwest Science/Math Program
Physical Evidence of Math/Science Theme

	Evidence Present			
Location	N	1989-1990	N	1990-1991
Classrooms	51	57%	51	63%
Animal/Fish		9%		0%
Plants		22%		39%
Science Charts/Posters		39%		43%
Science Models		2%		8%
Science Equipment		0%		10%
Math Charts		20%		12%
Math Manipulatives		2%		8%
Other Sites[1]	5	40%	12	42%
All Sites[2]	56	55%	86	58%

Note: Figures are rounded to the nearest/whole percent.
[1] Cafeteria, hallways, gym, office, etc...
[2] Classrooms, other sites, including math, and science classrooms.

Figure 5

Hands-on Learning in Science, Math and Computer Laboratories



Figures are rounded to the nearest whole percent. Based on 542 visits to labs.

evidence of the math theme using charts and 8% had visible math manipulatives. When examined for evidence of the science theme, 39% of all classrooms, except for science rooms, were found to have plants; 43% had science charts/posters; 8% had scientific models; 0% had animals or fish; and 10% of the non-science classrooms had evidence of science equipment. Overall, 63% of the classrooms had evidence of the theme; 42% of the other sites (e.g., cafeteria, gym, hallways, office) in the building had evidence and, of all 86 sites examined, including math and science rooms, 58% had theme-related evidence. When physical evidence results were compared to previous year findings, classroom evidence had increased as had evidence in other sites and across all sites examined in the building.

Perceptions

Parents, students, and teachers were contacted during the academic year regarding their perceptions of program functioning and to gain insight into emerging issues of importance to program participants. Perceptions held by program participants were compared across the three years of program implementation for trends in ratings of program satisfaction.

Teacher questionnaires were administered on-site, during regularly scheduled faculty meetings, by evaluation personnel. The questionnaires were group administered to all staff members. Provisions were made to assure anonymity. Parent perceptions were gathered through a telephone survey of a random sample of 27% of Southwest parents. Student perceptions were collected in a random sample of English classrooms. Approximately 15% of the students were sampled.

Teacher perceptions. Teacher perceptions of program implementation progress were gathered during the fall and spring terms. Teachers responded to a 27-item questionnaire. In addition to the current year's questionnaire results, the first two years of questionnaire administration results also can be found in Table 6.

Responses, across three years of program implementation, indicated that teacher perceptions of program functioning were decidedly less favorable in the third year than in the first year. In most areas measured, changes from the second year to the third year, with the exception of "information to infuse science" (item 7) and "informed about magnet school plan" (item 2), ratings of satisfaction and opportunity have declined.

*General program implementation. Tea*chers report being well informed about the theme (item 1, 95%) and the magnet school plan for Southwest (item 2, 94%). Ninety-two percent of the teachers report being able to infuse the magnet curriculum into their curricular areas

Table 6
Southwest Science/Math Program
Teacher Perceptions
1989, 1990, & 1991

Item Content	1989 (N = 50)[1]		1990 (N = 66)[1]		1991 (N = 85)[1]	
	Agree	Disagree	Agree	Disagree	Agree	Disagree
1. Science and mathematics theme is clear.	90%	10%	95%	5%	95%	5%
2. Informed about magnet school plan.	92%	8%	90%	10%	94%	6%
3. School is implementing theme.	78%	22%	90%	10%	78%	22%
4. Building magnet theme support staff provided support to implement theme.	50%	50%	70%	30%	50%	50%
5. Building level administrative support staff provided support to implement theme.	66%	34%	74%	26%	56%	44%
6. Information needed to infuse math has been provided.[2]	61%	39%	78%	22%	58%	42%
7. Information needed to infuse science has been provided.[3]	49%	51%	69%	31%	72%	28%
8. Able to infuse magnet curriculum.	88%	12%	92%	8%	92%	8%
9. Information needed for designing and conducting experiments has been provided.	54%	46%	58%	42%	44%	56%
10. Information needed to help students use statistical techniques has been provided.	44%	56%	59%	41%	34%	66%
11-14. There is good communication at this school:						
11. Among the faculty;	64%	36%	56%	44%	45%	55%
12. Between faculty and administration;	52%	48%	38%	62%	16%	84%
13. Between staff and parents;	70%	30%	54%	46%	42%	58%
14. Between staff and students.	90%	10%	70%	30%	57%	43%
15. Satisfied with staff development regarding theme.	59%	41%	53%	47%	42%	58%
16. Staff development regarding magnet school plan was informative.[4]	----	----	----	----	46%	54%
17. Would like additional staff development regarding infusion of science and mathematics.	52%	48%	60%	40%	47%	53%
18. Able to get materials to implement theme.	48%	52%	65%	35%	51%	49%
19. I am satisfied with the quality of instructional leadership provided by the administration this year.[4]	----	----	53%	47%	44%	56%
20. I believe my students are making good academic progress in this magnet program.[4]	----	----	51%	49%	40%	60%
21. I feel professionally challenged working in the science/math magnet program.[4]	----	----	73%	27%	70%	30%
22. Satisfied with support from math resource staff.[4]	----	----	71%	29%	54%	46%
23. Satisfied with support from science resource staff.[4]	----	----	71%	29%	64%	36%
24. Satisfied with support from computer resource staff.[4]	----	----	60%	40%	50%	50%

Table 6 (continued)
Southwest Science/Math Program
Teacher Perceptions
1989, 1990, & 1990

Item Content	1989 (N = 50)[1] Agree	1989 Disagree	1990 (N = 66)[1] Agree	1990 Disagree	1991 (N = 85)[1] Agree	1991 Disagree
25. Believe planetarium has been a useful instructional resource.[4]	----	----	----	----	66%	34%
26. Believe greenhouse and vivariums have been useful instructional resources.[4]	----	----	----	----	31%	69%
27. Overall, what rating would you give to the Southwest magnet program implementation during this year.						
Poor	14%		10%		19%	
Fair	30%		24%		19%	
Average	28%		45%		37%	
Good	20%		16%		19%	
Excellent	8%		5%		6%	

Note: Percentages are rounded to the nearest whole percent.

[1] Only those teachers who had expressed an opinion are included. Those responding "no opinion," "do not know," or "not applicable" are not included in the results.

[2] Only teachers who teach non-math subjects are reported.

[3] Only teachers who teach non-science subjects are reported.

[4] This question not asked in 1989 and/or 1990.

(item 8). However, when compared to the previous year, a lower percentage of teachers believed the school was implementing the magnet theme (item 3). Furthermore, when compared to the previous year, a slightly lower percentage of teachers reported feeling professionally challenged working in the science/math magnet program (item 21). As such, most teachers believe they are well informed of the magnet plan and theme; are challenged professionally; were able to infuse the theme; and felt confident that the school was implementing the theme.

The decline of perceptual ratings across years in many areas is of concern. An additional issue noted from teacher perceptual data regards student progress. As item 20 indicates, only 51% of the teaching staff believed students were making good academic progress in the magnet program during the second year of implementation. In the third year this figure has further declined to 40%. This finding appears to be in contradiction with other teacher perceptions mentioned previously which suggested that the majority of teachers reported being able to

infuse math and science, believed the school was implementing the program according to the goals and objectives established, felt well informed, and were professionally challenged. These findings may suggest that teachers are becoming frustrated with student progress. Teachers may not be confident that their actions will have an impact upon student academic progress.

Support and information. Questionnaire items 4, and 5 asked teachers to indicate their level of agreement with statements regarding the support received from building resource and administrative resources. Fifty percent of the teachers indicated having received support from magnet theme staff. Fifty-six percent reported having received support from administrative support staff. Teacher perceptions of the quality of assistance and support received, and of the instructional leadership provided by the administration and resource teachers appears somewhat mixed. Slightly less than half of the teachers report satisfaction with the quality of instructional leadership provided by the administration (item 19, 44%). When queried about the support received from resource staff, teachers report slightly more satisfaction with science (64%) resource support than they do with the math (54%) and computer resource support (50%, items 22, 23, and 24). Changes in the satisfaction level of teachers from the previous year to the current year suggest that teachers were not as satisfied in the third year. The most substantial change occurred with math resource where 17% fewer teachers were satisfied in the third year, as compared to the second year.

Items 6, 7, 9, and 10 asked teachers to indicate their level of agreement with statements regarding information dissemination. While a majority of teachers have received information to help them infuse math and science, substantially more teachers have received science infusion information than have received math infusion information (items 6 and 7). Additionally, less than half of the teachers indicated having received information needed to design and conduct experiments, and only 34% had received information to help students use statistical techniques (items 9, 10). Similarly, about half of the teachers report having received needed materials to implement the magnet theme (item 18).

Cumulatively, when examined across the three years of implementation, these perceptions suggest that information necessary for program implementation has been provided sporadically. Responses suggested that teachers believed they had received more information in the second year, as compared to the first year. But in the third year, teachers are indicating that information has not been as available as was found in the second year.

Within-school communication. Teacher perceptions of the quality of communication among faculty (item 11), between faculty and administration (item 12), and between staff and parents (item 13) have been steadily declining since the first year of program implementation. Somewhat less than 50% of the teachers believed communication among faculty was good. Similarly, only 16% felt communication among faculty and administration was good, and 42% of the teachers felt communication between staff and parents was good. Perceptions of communication quality between staff and students have consistently declined as well. As noted in the previous year evaluation report, "these figures are, in and of themselves, important indicators of the school climate as perceived by teachers" (Moore, 1990). Consequently, the substantial declines in the perceived quality of communication, especially between teachers and the school administration, and between teachers and students, signals a potential hinderance to the effective implementation of the magnet program at Southwest.

School leadership was asked, in the second year and third year of implementation, if any efforts had been undertaken to address improved communication. The following program initiatives were identified: regularly scheduled staff meetings, a staff advisory committee, daily bulletins, and newsletters to staff. Parent/staff communication has been addressed with the implementation of school newsletters and a call-in telephone information access program. The call-in program provides recorded information about upcoming school events and activities.

Safety at Southwest. Southwest and Southeast high schools were noted by the local media in the 1990-1991 year for incidents involving student violence involving handguns or other potentially threatening actions. Teacher ratings at Southwest and a sample of other district schools indicate that 28% of Southwest teachers consider the school to be "very safe." Twenty-four percent of the teachers at Van Horn High School considered the environment to be "very safe." Conversely, 38% of Southeast teachers consider their school to be "very safe." Greater than 60% of the teachers at Metropoliton High School believed their school to be "very safe."

At the other end of the response scale, 13% of Southwest teachers rated the school "very unsafe." Nine percent of Southeast teachers rated their school "very unsafe." Sixty-four percent of the teachers at Van Horn believed the school was "very unsafe." Seventeen percent of Metropoliton teachers rated their school as "very unsafe." The balance of the teachers in each of these schools rated their program as "moderately safe/unsafe."

School leadership at Southwest noted, when asked if Southwest was a safe place to work and go to school, that the incidents cited in the press were anomolies that happen in any school. Leadership believes that Southwest is a safe school. Alternately, leadership reported that during the 1990-1991 school year, handguns were found in the possession of students four times. District proposals for additional magnet funding for increased security at Southwest for upcoming years are pending.

Overall program implementation rating. Teacher ratings of program implementation indicated that 25% believe the implementation has been excellent or good in 1991. Conversely, 38% rated the implementation as fair or poor. When 1991 ratings were compared to first year ratings, no substantial changes in perceptions of the quality of implementation were found.

Parent perceptions. In a random sample of 316 parents/guardians of Southwest students, parents traditionally have been satisfied with most features of the magnet program (see Table 7). In fact, during the 1990-1991 year, almost 90% of the responding parents are satisfied with the math component (item 1, 88%); science component (item 2, 92%); and computer activities (item 3, 87%). This favorable attitude is somewhat mediated by the slightly less favorable perception that parents hold regarding their child's progress in the magnet program. Slightly less than three-quarters of parents are satisfied with their child's progress in science (item 10, 72%), and math (item 11, 66%). Parent satisfaction with their child's performance in the basic skills was greater than that for math or science (item 12, 77%). Parent satisfaction with academic progress has improved since the second year of implementation but parents are typically less satisfied when compared to first year perceptions.

When parents were asked to relate their satisfaction with school communication, principal responsiveness, and how well their participation was received at the school, the response was positive but suggested less satisfaction than in previous years (items 7, 13, 14). Eighty-five percent of the parents report receiving clear and understandable communications from school personnel (item 6). Slightly more than three-fourths felt the principal at Southwest was responsive to their concerns (item 13; 77%), and 91% (item 14) believed their participation at school was welcomed.

When asked about the impact of the magnet program, 85% of the parents believed the science/math magnet program will be beneficial to their child's future (item 4). Furthermore, two-thirds felt the program had increased their child's interest in science and/or math (item 5; 67%). Lastly, a majority of parents were satisfied with Southwest as a whole (item 17, 81%)

Table 7
Southwest Science/Math Program
Parent Perceptions
1989, 1990, & 1991

Item Content		1988-1989 (N = 213)		1989-1990 (N = 150)		1990- 1991 (N = 316)	
		Agree	Disagree	Agree	Disagree	Agree	Disagree
1.	Satisfied with math program.	88%	12%	97%	3%	88%	12%
2.	Satisfied with science program.	91%	10%	97%	3%	92%	8%
3.	Satisfied with computer activities.	90%	10%	90%	10%	87%	13%
4.	Believe program will benefit child in future.	----	----	----	----	85%	15%
5.	Believe program has increased child's interest in math and/or science.	----	----	----	----	67%	33%
6.	Science and mathematics theme clear.	79%	21%	92%	8%	81%	19%
7.	Communications understandable and helpful.	95%	5%	92%	8%	85%	15%
8.	Able to take math course he/she signed up for.	91%	9%	86%	14%	87%	13%
9.	Able to take science course he/she signed up for.	93%	8%	88%	12%	90%	10%
10.	Satisfied with progress made in science.	69%	32%	57%	43%	72%	28%
11.	Satisfied with progress made in math.	70%	31%	57%	43%	66%	34%
12.	Satisfied with progress made in other basic skills.	83%	17%	61%	39%	77%	23%
13.	Overall, feel the principal is responsive.	87%	13%	94%	6%	77%	23%
14.	Your participation as a parent is welcome.	96%	4%	99%	1%	91%	9%
15.	School is clean and in good repair.	90%	10%	86%	14%	94%	6%
16.	Recommend school to other parents.	86%	14%	89%	11%	78%	22%
17.	Overall, satisfied with Southwest.	85%	15%	87%	11%	81%	19%
18.	Know how students are selected for magnet schools.	30%	70%	57%	43%	36%	64%
19.	Think the way students were chosen for magnet schools is fair.[1]	71%	29%	64%	36%	45%	54%
20.	Child applied to attend Southwest High School.	----	----	----	----	60%	40%
21.	Application was handled in a reasonable amount of time.	88%	12%	89%	11%	85%	15%
22.	Use school district transportation.	84%	16%	83%	17%	92%	8%
23.	Transportation takes reasonable amount of time.[2]	92%	8%	88%	12%	95%	5%
24.	Transportation is safe.[2]	79%	21%	82%	18%	91%	9%

Note: Percentages are rounded to the nearest whole percent. Percentages do not include those who did not have an opinion.

[1] Based on responses of parents who reported knowing how students were selected (1989, N = 59; 1990, N= 85; 1991, N= 114).

[2] Based on responses of parents whose children use district transportation (1989: # 23, N= 179; # 24, N= 169; 1990: # 23, N= 125; # 24, N= 125; 1991: # 23, N= 288; # 24, N= 282).

and would recommend the program (school) to other parents (item 16, 78%). However, satisfaction with Southwest has declined since the first and second years of implementation. For a further examination of parent perceptions see Appendix B, Tables B-1, B-2, and B-3.

Student perceptions. Southwest students (N= 193) participated in the data collection of perceptions of the magnet program at Southwest (see Table 8). Approximately one-third of the English/language arts classrooms (16% of the student body) were randomly sampled. Students were given a 48-item questionnaire with questions examining six broad areas of their magnet experience: the math component, the science component, opportunities to participate in theme-related activities, school climate, communication, and challenge of the academic program. In general, student perceptions of their magnet school experience are mixed, with some areas suggesting relative satisfaction, and others demonstrating concern.

Math component. Items 1 through 8 in Table 8 queried students about their math program experience. Typically, students reported that they were enrolled in a math class (item 1, 94%) and were able to take the math class(es) they signed up for (item 2, 83%). A majority of students reported feeling as if they learned a lot in math class (item 4, 72%) and having had an opportunity to solve interesting math problems (item 3, 81%). Sixty percent of the students reportedly liked their math classes (item 6) and liked working on math problems (item 5, 63%). More than half of the students liked mathematics in general (item 7; 63%) and have had non-math teachers relate math to the subjects they teach (item 8; 71%). While the same percentage of students were enrolled in a math class in the first year of implementation as were enrolled in the third year, and the same percentage actually liked working math problems, student perceptions of their math experience have moderately improved.

Science component. Although much of the evidence already presented, and supported by TAP achievement data (discussed in the next section), suggests a greater emphasis on the science component of the theme at Southwest, student perceptions are slightly less favorable toward science. Items 9 through 16, in Table 8, address the student's experience in the science component. An equal percentage of students report being enrolled in science class as in math class (item 9, 94%), but fewer students have been able to take the science class they signed up for (item 10, 78%) as compared to their math class enrollment. Slightly more than half of the students report having had an opportunity to work on challenging science projects (item 11, 54%) and having had assistance from non-science teachers to relate science to other subjects (item 16, 59%). Similarly, 58% of the students reported feeling as if they had learned a lot in

Table 8

Southwest Science/Math Program

Student Perceptions

1989, 1990, & 1991

Item	Content	1988-1989 (N = 212) Yes	1988-1989 (N = 212) No	1989-1990 (N = 184) Yes	1989-1990 (N = 184) No	1990-1991 (N = 193) Yes	1990-1991 (N = 193) No
1.	Enrolled in a math class.	94%	6%	93%	7%	94%	6%
2.	Able to take the math class I signed up for.	78%	22%	77%	24%	83%	17%
3.	Opportunity to solve challenging math problems.	71%	29%	65%	35%	81%	19%
4.	Learning a lot in my math class.	66%	34%	63%	37%	72%	28%
5.	Like working math problems.	63%	37%	62%	38%	63%	37%
6.	Like my math class.	57%	44%	57%	43%	60%	40%
7.	Like math.	62%	38%	62%	38%	63 %	37%
8.	Teachers have helped me relate math to the subject they teach.	64%	37%	57%	43%	71%	30%
9.	Enrolled in a science class.	93%	7%	87%	13%	94%	6%
10.	Able to take the science class I signed up for.	81%	19%	70%	30%	78%	23%
11.	Opportunity to work on challenging science experiments or projects.	36%	65%	37%	63%	54%	46%
12.	Learning a lot in my science class.	70%	30%	58%	42%	58%	42%
13.	Like my science class.	61%	39%	51%	49%	57%	43%
14.	Like working on science experiments and projects.	56%	44%	60%	40%	59%	41%
15.	Like science.	54%	46%	53%	47%	48%	52%
16.	Teachers have helped me relate science to the subjects they teach.	51%	50%	49%	51%	59%	41%
17.	Opportunity to use computers.	65%	35%	78%	22%	78%	22%
18.	Enrolled in a computer class.	44%	56%	34%	66%	35%	65%
19.	Opportunity to design experiments.	22%	73%	21%	79%	37%	63%
20.	Opportunity to conduct experiments.	37%	67%	28%	72%	56%	44%
21.	Opportunity to use statistics	40%	60%	36%	64%	43%	57%
22.	Counseling office has helped me plan courses.	58%	42%	34%	66%	46%	54%
23.	Opportunity to learn how to fill out job or college applications, write a resume, and/or participate in interviews.	47%	53%	48%	53%	40%	60%
24.	Participated in classes or activities at Southwest this year which have given me information on how to get along with people of other races.	34%	67%	42%	58%	46%	55%

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Table 8 (continued)

Southwest Science/Math Program

Student Perceptions

1989, 1990, & 1991

Item Content		1988-1989 (N = 212)		1989-1990 (N = 184)		1990-1991 (N = 193)	
		Yes	No	Yes	No	Yes	No
25.	Opportunity to be involved in the events and activities related to the foreign exchange program.	24%	76%	19%	81%	24%	76%
26.	Participated in extra-curricular activities.	58%	42%	51%	49%	61%	39%
27.	Self-discipline of the students at Southwest has improved since the beginning of the year.	44%	56%	37%	63%	65%	35%
28.	Students at Southwest get along well with students of other races and cultures.	62%	38%	46%	54%	47%	53%
29.	Students at Southwest show respect for each other.	20%	80%	21%	79%	10%	90%
30.	Students at Southwest care about what happens to other students.	30%	70%	30%	70%	28%	72%
31.	Students at Southwest are helpful.	31%	69%	28%	72%	24%	76%
32.	Feel safe at Southwest.	55%	45%	51%	49%	48%	52%
33.	Feel comfortable at Southwest.	61%	39%	65%	35%	66%	34%
34.	Feel welcome at Southwest.	66%	34%	61%	39%	69%	31%
35.	Students at Southwest are well behaved in class.	17%	84%	23%	77%	12%	88%
36.	Students at Southwest are well behaved in the halls.	19%	81%	20%	80%	17%	83%
37-41.	There is good communication between the students at Southwest and:						
37.	the teachers:	57%	43%	43%	57%	50%	49%
38.	the principal;	24%	76%	8%	92%	10%	90%
39.	the assistant principal;	24%	76%	29%	71%	47%	53%
40.	the secretaries in the office;	58%	42%	54%	46%	45%	55%
41.	the counselors.	61%	39%	49%	51%	49%	51%
42.	Teachers challenge me to work hard.	73%	27%	62%	38%	70%	30%
43.	Classes seem too easy.	28%	72%	23%	77%	20%	80%
44.	Teachers seem willing to work with students to help them understand.	75%	25%	58%	42%	63%	37%
45.	Classes are challenging.	69%	31%	64%	37%	74%	26%
46.	Wish my classes were more challenging.	35%	65%	39%	61%	31%	69%
47.	Like my classes at Southwest.	69%	31%	64%	36%	75%	25%
48.	Am glad I go to Southwest.	65%	35%	70%	30%	73%	28%

Note: Percentages are rounded to the nearest whole percent.

their science class(es) (item 12). Again, a slight majority of the students like their science class (item 13, 57%) and less than half like science in general (item 15, 48%). When student perceptions were examined across the three years of program implementation, declining numbers of students were able to take the science class they wished to take; liked science; liked their science class(es); and believed they had learned a lot in science class.

Opportunities to participate. In most instances, the majority of students report not having had many opportunities to participate in relevant magnet theme-related experiences. Items 19 through 21 suggest that students have not generally been provided the setting to design (item 19; 63%) or conduct (item 20; 44%) experiments. Additionally, more than half have not used statistical analyses in their classes (item 21; 57%). Alternately, over the three years of implementation, the percentage of students who reported having had these experiences has risen moderately.

School climate. Items 27 through 36 overwhelmingly suggest that a significant portion of the Southwest student body is concerned with the school climate and their peers behavior. Furthermore, results across the three years of implementation suggest that students perceive the school climate to be progressively less friendly and safe. Less than 20% believed that students were well behaved in classes (item 35; 12%) or in the hallways (item 36, 17%), and only 10% of the students believed their peers showed respect for each other (item 29).

Less than 30% of the students felt as if their peers cared about what happens to other students (item 30; 28%) and a majority did not feel their classmates were helpful to others (item 31, 76%). Less than half believed their peers get along well with students of other races and cultures (item 28; 47%). Curiously, this environment may not be particularly worrisome to the majority as 66% of the students felt comfortable (item 33) and 69% felt welcome at Southwest (item 34). Alternately, less than half of the students report feeling safe while at Southwest (item 32, 48%).

Communication. Items 37 through 41 asked students to indicate their level of agreement regarding the quality of communication between themselves and other school groups. Fifty percent or fewer of the students felt communication was good between themselves and the teachers (item 37; 50%), the assistant principals (item 39; 47%), the secretaries in the office (item 40; 45%), and the counselors (item 41; 49%). Only 10% of the students felt communication with the principal was good (item 38).

Academic challenge. Overall, 74% of the students reported feeling challenged in their classes (item 45) and by their teachers (item 42, 70%). Slightly more than 60% of the students reportedly had teachers who were willing to help them understand their classes (item 44, 63%) and students generally liked the classes they took at Southwest (item 47, 75%). Alternately, almost one-third of the students wished their classes were more challenging (item 46; 31%). Finally, 73% of the students sampled were glad they attended Southwest High School (item 48).

Achievement

Tests of Achievement and Proficiency (TAP) percentile ranks, Missouri Mastery and Achievement Test (MMAT) average scale scores, and Degrees of Reading Power (DRP) percentile ranks of students are reported for district and Southwest students. The data have been collected from the district's Testing Office. TAP scores are disaggregated by minority/non-minority status of students. Additionally, 1989 ninth grade minority and non-minority students, who have completed three years in the Southwest magnet program, were tracked across time to identify TAP achievement trends in reading, math, science, and written expression test performance. Lastly, Southwest students were statistically compared to a random sample of other district high school students to identify whether TAP achievement differences existed across four content areas.

TAP. Tables 9A and 9B displays the percentile ranks of minority and non-minority students by content area tested and by grade level. In addition, the district and national norms are reported for reference. Percentile ranks reported are calculated from mean grade equivalent scores and are based upon 1985 individual student norms. As such, the reported percentile ranks indicate the relative performance of Southwest students as compared to the most recent norm group (1985). It should be noted that a percentile rank of 50 is the national average for the TAP.

Reading achievement. As Table 9A indicates, Southwest minority students scored below the district and national norms in all grade levels in 1991. Non-minority students were above the district norm in ninth and tenth grade reading and above district and national norms in eleventh and twelfth grade reading. TAP score improvement since before program implementation (1988) has been slight at most grade levels. While minority students, at each grade level, have had moderate (grades nine and ten) to minimal (grades eleven and twelve) gains,

Table 9A
Tests of Achievement and Proficiency Percentile Ranks
Southwest Science/Math Program
1988, 1989, 1990, & 1991

	Reading Comprehension						Written Expression					
Grade					Dist.	Nat'l					Dist.	Nat'l
Ethnic	1988	1989	1990	1991	1991	Norm	1988	1989	1990	1991	1991	Norm
Nine					41	50					45	50
Minority	13	36	37	29			19	47	44	39		
Non-Minority	45	54	51	48			33	54	50	45		
Ten					43	50					44	50
Minority	26	32	32	39			27	30	37	38		
Non-Minority	57	64	55	47			48	57	52	46		
Eleven					40	50					42	50
Minority	30	39	27	31			28	36	25	37		
Non-Minority	63	64	60	58			43	55	45	40		
Twelve					39	50					41	50
Minority	16	28	30	20			17	28	33	27		
Non-Minority	57	65	42	65			36	52	30	43		

Note: Based on mean grade equivalent scores.

non-minority students have had declines, relative to the norm group at the tenth and eleventh grades.

Written expression achievement. When 1991 written expression scores were examined, Southwest's non-minority students were below district norms at the eleventh grade. Grades nine, ten, and twelve were at or above district norms. All minority students at Southwest scored below the national norm in written expression. Student performance in written expression, since the year before implementation (1988), has not improved substantially during program implementation. Furthermore, declines, relative to the norm group, were found (non-minority, grades ten and eleven).

Mathematics achievement. Minority students were below the district and national norms in mathematics at each grade level in 1991. Non-minority students performed above the district norm at each grade level. Furthermore, non-minority students scored above the national norm at the ninth, tenth, and twelfth grades. 1991 scores, when compared to baseline performance (1988), were slightly better, across the four grades. However, year-to-year growth was not substantial, and in one case a decline was found (minority, grade twelve).

Table 9B
Tests of Achievement and Proficiency Percentile Ranks
Southwest Science/Math Program
1988, 1989, 1990, & 1991

	Mathematics						Science					
Grade					Dist.	Nat'l					Dist.	Nat'l
Ethnic	1988	1989	1990	1991	1991	Norm	1988	1989	1990	1991	1991	Norm
Nine					36	50					40	50
Minority	12	30	35	27			11	25	25	29		
Non-Minority	47	55	49	54			28	44	59	63		
Ten					40	50					46	50
Minority	24	34	30	35			13	19	23	34		
Non-Minority	50	59	46	53			40	47	46	61		
Eleven					40	50					43	50
Minority	29	36	27	36			12	18	25	37		
Non-Minority	44	58	53	48			32	46	58	58		
Twelve					39	50					41	50
Minority	25	35	26	24			8	13	22	28		
Non-Minority	54	56	45	57			48	53	51	65		

Note: Based on mean grade equivalent scores.

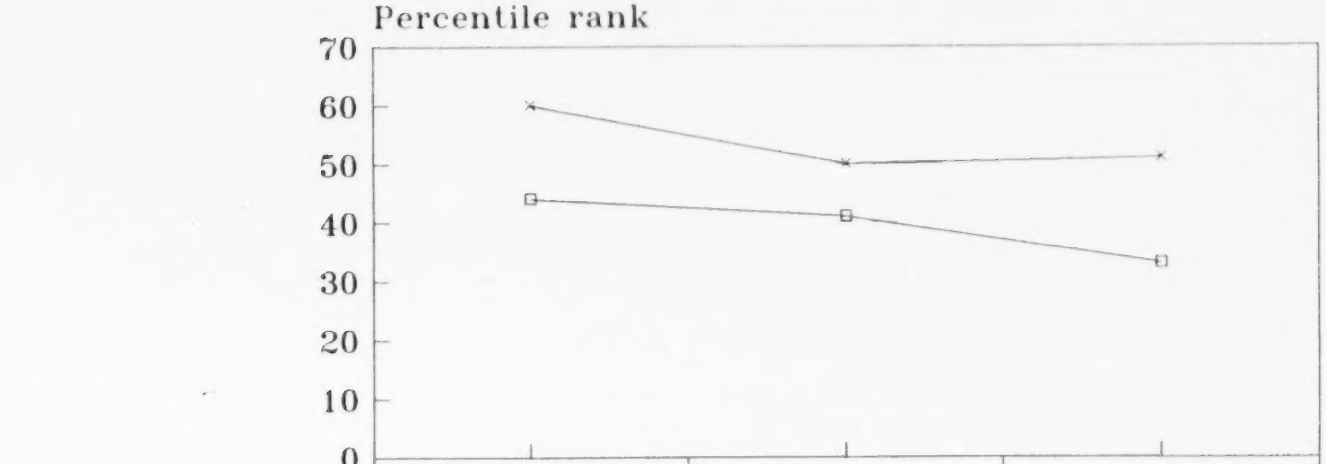
Science achievement. In 1991, Southwest's minority students scored below the district and national norms in science at each grade level. Conversely, non-minority students performed above the district and national norms at each grade level. When baseline (1988) scores were compared to year three (1991) scores for both minority and non-minority students, it was found that each grade made substantial improvements toward the national norm.

TAP achievement trends. The achievement performance of ninth graders, who entered the newly implemented science/math program at Southwest in 1988-1989, were tracked across time to the spring 1990-1991 TAP testing. Only those students who remained enrolled in the Southwest magnet program and who had TAP achievement scores for each of the last three years were included in the cohort. The assumption behind cohort tracking is that instructional and/or school-based influences, among others, would be detected through an examination of the historical performance of those students who had been in the program continuously, and would be reflected in an increasing, or slower decline, achievement performance.

Reading achievement. An examination of Figure 6 indicates that both minority and non-minority students had declines in TAP scores from ninth to tenth grade. From the tenth to

Figure 6

TAP Reading Achievement Across Time: Ninth Grade Cohort



	Ninth 1989	Tenth 1990	Eleventh 1991
Minority	44	41	33
Non-Minority	60	50	51

Grade/Year

Note: Percentile ranks were converted from mean grade equivalent scores

eleventh grade the minority trend continues downward while the non-minority trend reverses and demonstrates a leveling off slightly above the national norm. However, these long-term cohorts, both minority and non-minority, have scores at the end of three years in the program below their scores after just one year in the program.

Written expression achievement. As can be seen in Figure 7, written expression achievement has steadily declined, relative to the norm group, during the three years of implementation. However, 1991 figures suggest a slowing decline for minority students. As such, the achievement deficit between the two groups has narrowed from seven to five percentile points.

Mathematics achievement. After a slight decline in the tenth grade, non-minority student performance has remained relatively unchanged in the eleventh grade (see Figure 8). Minority student math performance has remained virtually the same over the three years of program implementation.

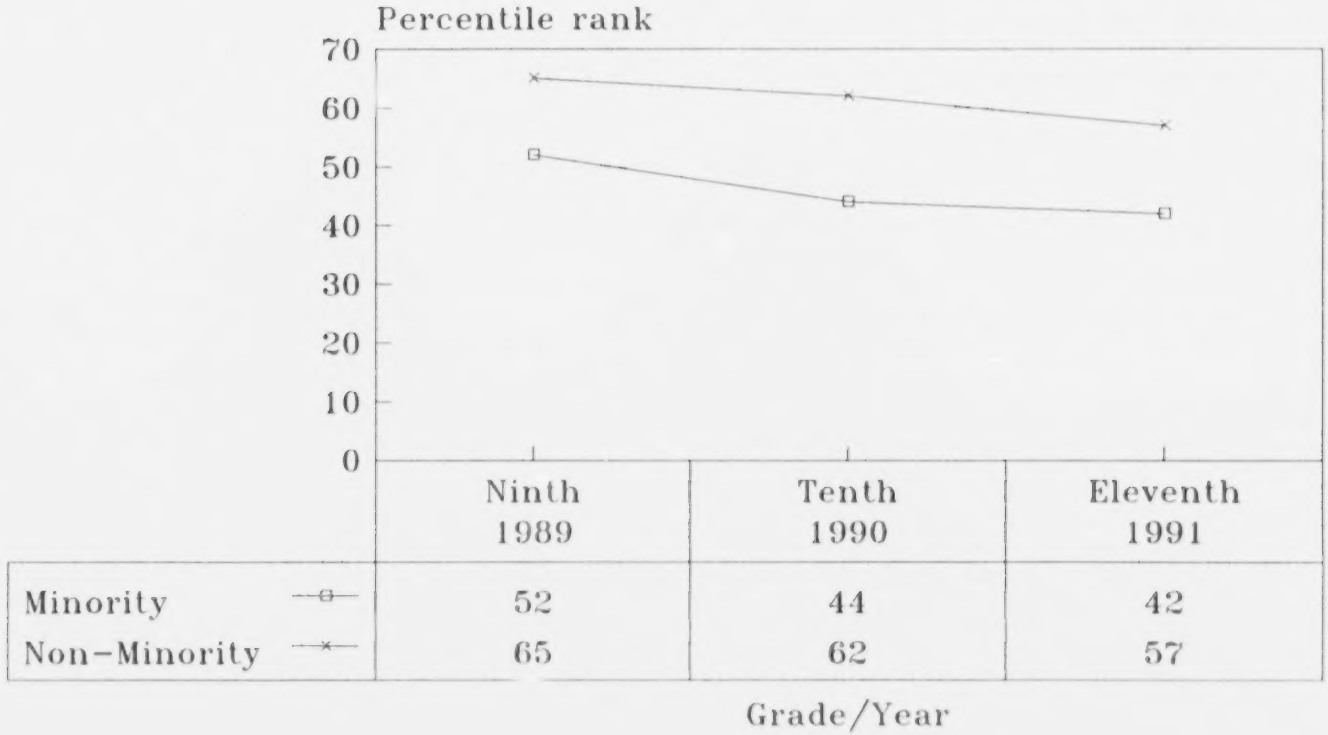
Science achievement. Both minority and non-minority cohort groups have had improving science achievement since program implementation (see Figure 9). Minority students have improved, relative to the norm group, 19 percentile points since the ninth grade. Non-minority growth, after a seven percentile point improvement in the tenth grade, has had a one point decline in the eleventh grade. Figure 9 demonstrates the narrowing of the achievement deficit between minority and non-minority students over the three years of program implementation.

Southwest students compared to other district students. Table 10 presents the results of comparisons between Southwest students and a random sample of other district high school students. Analysis of covariance (ANCOVA) procedures were utilized to determine if statistically significant differences existed between the two groups on the TAP. The readers will note that two means, unadjusted and adjusted, are reported in Table 10. Unadjusted means represent the percentile rank of the mean grade equivalent score for the group, without any adjustment for pre-existing achievement differences between the members of each group. Adjusted means represent the percentile rank of the mean grade equivalent score which has been statistically determined after pre-existing differences have been removed or equalized. Adjusted means are derived during the ANCOVA procedure and are used for the statistical comparison. Means have been adjusted with Cognitive Abilities Test scores.

Reading. Analysis of covariance results indicated that the sample district students outperformed Southwest students in reading at grades nine and twelve. No significant differences were found between sample and Southwest students at grades ten and eleven.

Figure 7

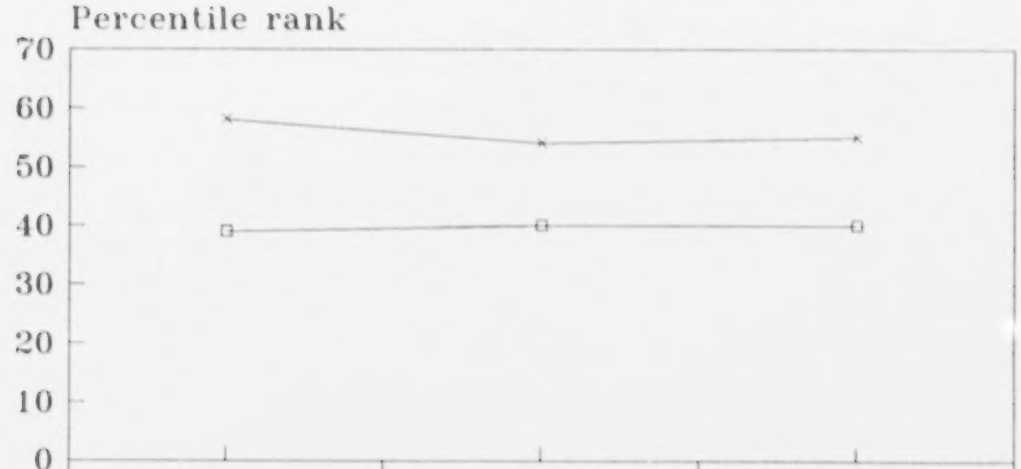
TAP Written Expression Achievement Across Time: Ninth Grade Cohort



Note: Percentile ranks were converted from mean grade equivalent scores

Figure 8

TAP Math Achievement Across Time: Ninth Grade Cohort



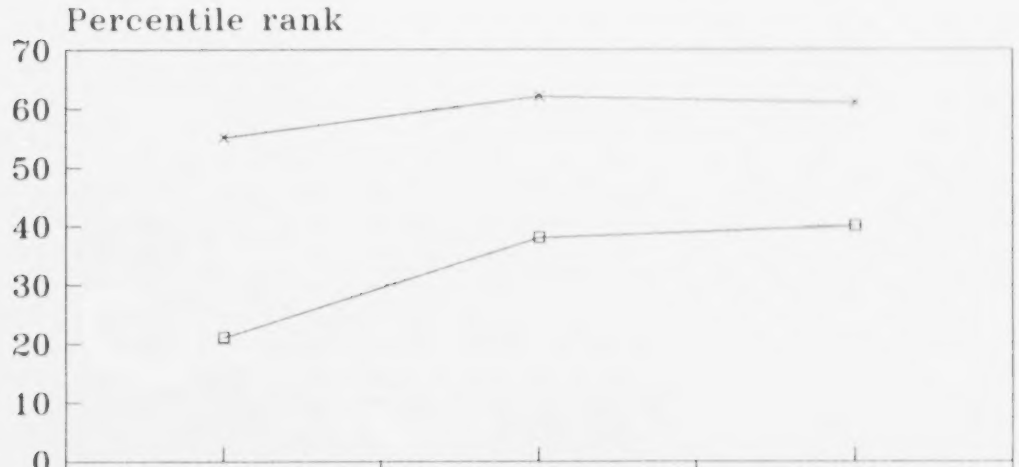
	Ninth 1989	Tenth 1990	Eleventh 1991
Minority	39	40	40
Non-Minority	58	54	55

Grade/Year

Note: Percentile ranks were converted from mean grade equivalent scores

Figure 9

TAP Science Achievement Across Time: Ninth Grade Cohort



	Ninth 1989	Tenth 1990	Eleventh 1991
Minority —□—	21	38	40
Non-Minority —×—	55	62	61

Grade/Year

Note: Percentile ranks were converted from mean grade equivalent scores

Table 10
Southwest Science/Math Program
1991 Summary Data Comparing Math/Science High School Students and Randomly Selected District High School Students

Test Grade Means	Math/Science Percentiles	Sample Percentiles	Probability
Reading			
Grade 9			
Unadjusted mean	36	37	.011
Adjusted mean	33	40*	
Grade 10			
Unadjusted mean	37	33	
Adjusted mean	35	35	.744
Grade 11			
Unadjusted mean	37	38	.165
Adjusted mean	33	37	
Grade 12			
Unadjusted mean	24	37	
Adjusted mean	29	36*	.003
Written Expression			
Grade 9			
Unadjusted mean	44	44	
Adjusted mean	42	45	.162
Grade 10			
Unadjusted mean	43	40	.846
Adjusted mean	41	40	
Grade 11			
Unadjusted mean	42	37	
Adjusted mean	40	37	.265
Grade 12			
Unadjusted mean	31	39	
Adjusted mean	32	38*	.026

Table 10 (continued)
Southwest Science/Math Program
1991 Summary Data Comparing Math/Science High School Students and Randomly Selected District High School Students

Test Grade Means	Math/Science Percentiles	Sample Percentiles	Probability
Math			
Grade 9			
Unadjusted mean	33	32	
Adjusted mean	31	34	.246
Grade 10			
Unadjusted mean	42	32	.036
Adjusted mean	37*	34	
Grade 11			
Unadjusted mean	41	38	
Adjusted mean	40	39	.729
Grade12			
Unadjusted mean	29	38	
Adjusted mean	32	37*	.015
Science			
Grade 9			
Unadjusted mean	35	32	.781
Adjusted mean	34	33	
Grade 10			
Unadjusted mean	45	29	
Adjusted mean	41*	31	.008
Grade 11			
Unadjusted mean	42	32	
Adjusted mean	42*	33	.014
Grade 12			
Unadjusted mean	35	36	
Adjusted mean	32	37	.179

Note: *= The difference between magnet and sample groups was significant at $p \leq .05$. Analysis was done using grade equivalent scores. For presentation, these scores were converted to percentiles. The adjusted mean represents a statistical estimate of the students' performance on the 1991 posttest, assuming that the groups had identical 1990 pretest means. This adjusted mean is computed during the analysis of covariance procedure and is to be used for comparison purposes. All grades used Cogat scores as the covariate.

Written expression. Significant differences were found between Southwest and sample students at grade twelve, with sample students outperforming Southwest students. No significant differences were found at grades nine, ten, and eleven.

Mathematics. Significant differences were found at grades ten and twelve for math TAP achievement. Southwest tenth graders outperformed sample students. Conversely, sample students had significantly higher scores at grade twelve. No significant differences were found at grades nine and eleven.

Science. Southwest tenth and eleventh graders had significantly higher scores in science achievement. No significant differences were found at grades nine and twelve.

MMAT. Table 11 presents the results of the 1990-1991 MMAT test administration as well as previous year results. MMAT scores are reported in average scale scores and are referenced to district and state averages. The scores indicated that Southwest tenth grade students were scoring equal to, or higher than, the district average in English, math, science, and social studies. An examination of MMAT scores at Southwest across four years of testing indicated that math, science, and social studies scores have typically improved each year. English scores had been improving annually. However, in 1991, scores have declined compared to 1990 performance. In all areas tested, Southwest is scoring lower than the state average.

DRP. Lastly, Table 12 presents mean Degree of Reading Power (DRP) results for grades 9, 10, and 11. During the first two years of magnet implementation, Southwest has scored near or above the district mean. In year three (1991) the district did not test students at the tenth and eleventh grade. An examination of ninth grade DRP scores indicated that Southwest students scored below the district average and had scores below prior year ninth grade scores.

Table 11
Southwest Science/Math Program
MMAT Average Scale Scores, Grade 10
1988, 1989, 1990, and 1991

	English Language Arts				Math				Science				Social Studies			
Location	1988	1989	1990	1991	1988	1989	1990	1991	1988	1989	1990	1991	1988	1989	1990	1991
Southwest	258	264	293	273	251	263	284	287	261	261	269	286	253	254	276	268
District	258	274	288	273	260	270	270	278	262	265	271	282	261	263	271	268
State	315	324	335	273	313	330	327	326	326	322	330	327	314	311	316	302

Table 12
Mean Degree of Reading Power Units
1989, 1990, & 1991

	Year-1 1989		Year-2 1990		Year-3 1991	
Grade	Southwest	District	Southwest	District	Southwest	District
9	64	63	66	63	61	63
10	63	64	69	65	--[1]	--[1]
11	66	65	65	66	--[1]	--[1]

[1] The district did not test this grade in 1991.

Summary and Recommendations

The Southwest science/math magnet program has been implemented for three years. At the end of the third year of magnet implementation Southwest, had five magnet-related staff vacancies. Alternately, building renovations have been completed, supplies and materials have been available for teacher utilization, and the specialized theme facilities and laboratories were utilized in the third year.

While Southwest had an increased enrollment in the 1990-1991 year, the program is still below capacity at three grade levels. Only at grade nine was actual enrollment greater than program capacity. However, the increased enrollment has had a resegregating effect on the magnet program. Fewer non-minority students were enrolled during 1990-1991 than were enrolled in 1987-1988. Each grade level had less than 20% non-minority enrollment during 1990-1991.

The results of classroom observations indicated that the science/math theme has been partially implemented into the instructional process. While problem-solving was occurring, most notably in theme classrooms, the rate of occurrence was still lower than would be expected in a science/math environment. Alternately, problem-solving opportunities have increased substantially (more than doubling in theme classes and tripling in English/social studies classes) during the three years of program implementation. However, students were exposed to more lectures and presentations and almost as much silent work, than they were problem-solving opportunities in the classroom. Program-wide observations found theme infusion occurring in less than 10% of the observation intervals. Furthermore, opportunities for students to design, conduct, analyze, and evaluate experiments was evident in less than 5%

of the observation intervals. While increasing evidence of experimentation has been found during the three years, the rate of occurrence seems particularly low. Similarly, the utilization of statistics was found in 3% of the observation intervals.

Over the course of the three years of implementation, this evaluation has found that total group instruction has steadily increased while individualized instructional activities have consistently declined.

Observations conducted in math, science, and computer laboratories, looking for evidence of hands-on learning activities, have found substantial increases in hands-on learning since the first year of implementation. Slightly less than half of the intervals found evidence in math and science labs.

Alternately, upon entering the building, it has not been immediately evident that the magnet theme was science/math. While physical evidence of the theme was found in many locations in the building, less than 60% of the 86 sites examined had evidence of the theme. Furthermore, of the 51 non-theme classrooms examined, slightly more than 60% had physical evidence of the theme observable.

Perceptual data from program participants indicated that teacher perceptions of program functioning were decidedly less favorable in the third year than they were in the first year. In most areas measured, changes from the second year to the third year, ratings of satisfaction and opportunity have declined. While many teachers felt professionally challenged, others expressed concerns over resource teacher support, instructional leadership, and student progress in the magnet program. Furthermore, many teachers were not satisfied with the degree of communication within the school and indicated dissatisfaction with the lack of information dissemination to teachers. Parent perceptions remained favorable during the three years of implementation. Two-thirds of parents believed the science/math program had increased their child's interest in science and/or math. Additionally, a majority of parents believed their child's future would be benefitted by their experience in the science/math magnet program at Southwest. Student perceptions of their magnet school experience were mixed. Results indicated that students believed they were learning more in the math component of the theme and enjoy math more than science. Many students reported not having had the opportunity to conduct experiments or use statistics. Alternately, most students felt challenged academically by their teachers and classes. Southwest teacher and student perceptions suggest concern with the degree of safety on campus. Less than one-third of the teachers

considered Southwest to be "very safe." Furthermore, less than half of the students felt safe at Southwest.

TAP achievement data for 1991 indicated that Southwest minority students, at each grade level, scored below the district norm in each of four content areas. With the exception of grade eleven written expression, non-minority students were at or above district norms at each grade for the four content areas. When minority and non-minority TAP achievement was compared to national norms, minority students were below norm at each grade and for each content area. Non-minority students were above the national norm at most grade levels in science and math.

Ninth grade cohort data indicated that TAP achievement trends, during three years of implementation, in reading, math, and written expression were declining or remaining static. Only in science did the minority group achievement performance improve substantially since program implementation.

Based upon the evidence collected for this summative evaluation, the following recommendations are offered:

1. Continue efforts to staff the five vacant magnet-related resource and teacher positions. Certainly, the lack of a full compliment of magnet-related staff members has great potential to undermine the effectiveness of the theme implementation. Of particular concern is the science transition teacher vacancy, given the at-risk population served.

2. Increase security and safety at Southwest. With school leadership indicating four instances of student possession of a handgun on campus, media reports of student violence, and unauthorized trespassers instigating violence with students, as well as unfavorable perceptions by students and teachers of campus safety, district leadership should address the problem of maintaining a secure and safe learning and teaching environment. Thirteen percent of teachers and almost 50% of the students do not believe Southwest provides a safe environment for education. Furthermore, 49% of the teachers believed the school's environment was only "moderately safe/unsafe."

3. Communication within the school and among program participants needs to be coordinated and consistent with all participants having access to each other and to relevant and timely information. Perceptual data of teachers, students, and to a lesser extent, parents, regarding satisfaction with school communication appears to have declined over the three years of program implementation, especially between faculty and school leadership. Similarly, teacher perceptions of the quality of their communication with students has declined from 90% to 57% during the three years of implementation. While parents still feel that the principal is responsive to their concerns, the percentage feeling so has declined by 10% during the last three years.

4. Explore with teachers their perception that their students are not making good academic progress. In 1990 this recommendation was offered to program leadership. At that time

51% of the teaching staff felt their students were progressing academically. At the end of the third year, this recommendation is again necessary. In 1991 40% of the teaching staff believe their students are making good academic progress. This result has particularly profound implications for teacher morale and willingness to extend support to students. If teachers do not believe their efforts are contributing to student learning, it is extremely important for school leadership to explore with teachers how their efforts could be supported and enhanced.

5. Consider increasing the instructional emphasis upon reading and written expression skills. TAP scores examined across three years, for those students who entered the magnet program as ninth graders in the first year of program implementation, indicate declining performance, relative to the national norm group, especially for minority students. While science and math achievement appears to have benefited from theme instruction, for both minority and non-minority students, reading and written expression achievement appears to have been relatively uninfluenced by program effects.

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Appendix A
SLD Pilot Project

SLD PILOT PROJECT

1990 School Year

HONOR ROLL

1st quarter-3 students
2nd quarter-3 students
3rd quarter-4 students

PERFECT ATTENDANCE

1st quarter-1 student
2nd quarter-1 student
3rd quarter-1 student

GOOD ATTENDANCE (over 95%)

1st quarter- 4 students
2nd quarter- 4 students
3rd quarter- 5 students

INFUSION

1. Students make, read, and interpret graphs.
2. Students compute latitude and longitude.
3. Students apply math skills to identify source of grade lowering factors.
4. Students figure percents from data.
5. Students use the scientific method in predicting character behavior in literature, in social skill problem solving, in troubleshooting computer operation, and in debugging computer programs.

FIELD TRIPS

1. KU Med Center-the students visited the pathology department.
2. "The Estimating Game" -the students visited the Kansas City Downtown Museum and participated in activities involving estimating.
3. Sycamore Bend Fisheries-the students will visit a fish hatchery and tour the facilities.
4. "Designer Genes" -the students will visit the Kansas City Downtown Museum and participate in activities dealing with genetics and ethical decisions.

TRANSITION TEACHERS

1. The transition science teacher incorporates hands-on science activities to support science curriculum and modifies the curriculum to maximize the students' understanding.
2. The math transition teacher incorporates hands-on math activities to support the math curriculum.

3. The transition teachers also monitor the students' progress in main-streamed classes. They are available to assist the students with assignments from these classes and keep in contact with the teachers of these classes.

MISCELLANEOUS

1. Students use computers and computer programs for science and math activities.
2. Students use computer word processing programs to complete assignments.
3. Students and their parents participate in parent/student group meetings.
4. Students write articles for a quarterly newsletter.

Appendix B
Summary of Planetarium Activities and Use

Summary of Planetarium Activities and Use
First Semester 1990-91 (Sept. - Jan)

	Classes from: Southwest HS	Other Schools	Total Number Students
Sept. 90:	29		740

Other activities:

4 staff inservice sessions -
- *Elementary Science Resource Teachers
- *Secondary Science Resource Teachers
- *IA's
- *CI, CC, PA

1 Girl Scout group after school
Astronomy Lab with Longview Com. Col. Astronomy class
Portable Planetarium Inservice: Bettendorf IA
Marion IL
Bloomfield MO

Building Dedication and Open House: Planetarium Demonstration

Oct. 90:	50	4	1350

Other activities:

Staff Dev. Workshop "Astronomy in the Classroom"
Staff Dev. Inservice: Southwest High School
Marlborough Elementary School
Project STARWALK Inservice - 3rd grade Teachers
Staff Dev. Workshop "Modeling Techniques"
NSTA Conference, KCMO: Presentations:
"Project STARWALK"
"CAA-Computer Assisted Astronomy"
"Dynamic Modeling - or How to Hug the Sky"
"NESTA Shar-A-Thon"
Telescope session with Longview Com. Col. Astronomy Class
District Task Force Meeting and Planetarium Demostration
Astronomy Club Meeting

	Classes from: Southwest HS	Other Schools	Total Number Students
Nov. 90:	29	6	875

Other activities:

Staff Dev. Inservice: Hartman Elementary School
Three Trails Elementary School
District Science Heads Meeting
Planetarium/Star Party
Meeting with Hartman Teachers to plan planetarium lessons
Planetarium orientation for district recruiters
Astronomy Club meeting
Project STARWALK/Starlab Inservice - Pittsburg KS
Portable Planetarium Inservice - Olathe KS

Dec. 90:	25	9	850

Other activities:

Southwest Boosters
Inservice 'Make-Up' Workshop
Middle School Visits (1 session)
Science Fair Advisor for students at Marlborough Elementary School

Jan. 91: (1/2-1/18)	12	2	350

Other activities:

Astronomy Club meeting
Portable Planetarium Inservice - Pacolet SC

Summary of Planetarium Activities and Use
Second Semester 1990-91 (Jan. - June)

	Classes from: Southwest HS	Other Schools	Total Number Students
Jan. 91: (1/19-1/31)	3	12	505

Other activities:

American Society of Interior Designers Meeting
Judging at Science Fair - Marlborough Elem.
Student Response Team Meeting
Staff Development - Cook Elementary
Longview Com. Col. Astronomy Class, Lab
Astronomy Club

Feb. 91:	4	29	1065

Other activities:

Staff Development - Wheatly Elementary
SE Annex
Cub Scouts Pack #3193
Public Sky Watch (2)
Interface '91 -
"Dynamic Modeling- Or How To Hug The Sky" - 2hr. workshop
Astronomy Club
Judging Science Fair at 3 Trails Elementary
Project STARWALK Level 4 Inservice

Classes from: Southwest HS	Other Schools	Total Number Students
March 91: 8	11	630

Other activities:

Project STARWALK Staff Inservice - Baton Rouge, LA
Public Skywatch (13)
Astronomy Club
Tiger Scouts & Young Cub Scouts
Kansas City Area Sci. Teachers Org. Meeting/Presentation
MO. City School District (All students- all grades)
Project STARWALK Level 5 Staff Inservice
NSTA National Conf. Houston, TX. - presentations:
"CAA-Computer Assisted Astronomy"
"Dynamic Modeling - or How to Hug the Sky"
"NESTA Shar-A-Thon" - Astronomy & Earth Science
"AAE Shar-A-Thon"

April 91:	11	44	1492

Other activities:

Solar Observing at Randall School (Independence) - fifth grade
Spitz Warrenty repairs - 4 days
Project STARWALK Level 6 Staff Inservice
Telescope Nighttime Viewing - Longview Com. Col.
Public Skywatch (37)
Brownie Pack presentation
Staff Development Inservice: Science Infusion with
Lynn Maroney; Native American Story Teller

May 91:

Other activities:

June 91:

Other activities:

Planetarium Visits by Grade Levels - September 1990 through May 10 1991

K	1	2	3	4	5	6	7	8	9	10	11	12
20	13	11	11	11	14	16	10	14	72	40	40	16

total number of classes: 288 (Sep-May 10)
total number of students: 7857 (Sep-May 10)

Appendix C
Extra Curricular Activities

Southwest Science/Math H.S. End of the Year Report

Evaluation Department

May 16, 1991

ORGANIZATION	ACTIVITY
Home Economics Club ___	Catered the Academic Decathlon
Extended Day Program_____	Taught LOGO (programming) to Border Star or seven weeks. These students entered competitions at the state level . This program was in conjunction with
Computer Club_	Southwests'computer club. (see attachment)
Science Club____	R.C. Regional Science Fair-Twelve students (4/11/91) Black Coalition Health Essay Contest-seventeen students (4/30) Science Olympaid -Twelve students Field Trips- Allied Signal - twenty-seven students Volunteers- Assisted several students in sci-fair projects and AP students with term papers and science proprosals. Dr. Elizabeth Nobel Virgil Evans and Bynen Steinin- Electrical Engineers who came every month for two months who received release time for Allied Signal (a community partner) Speaker- Dr. Elizabeth Nobel topic- Measurement in Evolution of Data
Aerospace Classes-	Field trip- Downtown airport-twenty students To actually hear and see their teacher renew his pilot's license and ride in airplane
Math Club	Build model rockets and launch Contest- Excerlsior Springs 2/2- thirteen students entered over fifteen schools around the state Junior team placed fourth and all juniors placed in an indiv.

	event. CMSU Contest: 3/2 fifteen student Over thirty schoold from around the state of Mo. Lynley Lewis placed in Trig. KCATM Contest: 3/9 fifteen students participated. Over 20 schools from Ks. and Mo. Our placed in several events Math Bowl: 5/3 and 5/5 twenty students . Interscholastic League , placed second overall
Math Class	Speakers: Young engineers from Allied Signal Aerospace plant- Karen L McMurray , Bryant Sterling and Ben Tate Lock -In: Students in college-prep Geometry members of the S.W. Decathlon Team spent the night at S.W. Studying and engaging in fun activities.
C.O.E.	Speakers: Ms. Gangel-Economics 11/15/90 Tim Latimer-Display planning and Research/construction 12/12/90 Forty Students in attendance at each hour of presentation. Mark maauser-K.C. Star 4/15 approx. 51 each hour for presentation of measurement of advert-color graphics, technology involved in printing the newspaper. Mr. Cook - Federal Reserve Bank-career in gov't and banks
Physical Ed. classes-	Speaker: Planned Parenthood 11/90 Approx. 95 students per hour. Topics; Aids, sexually transmitted diseases
Foreign Language club-	Speakers: Students from Italy Topic: The ecology of their country, drugs etc. Mr. McWilliams- Rain Forrest Mr. Rana Mrs. McClure Math infusion in Spanish , adding, substracting, multiplying problems in target language. Science infusion in target language- body parts and animals as well as environmental problems.

International Club-	Extra Curricular: Subject at meeting: Curriculum requirements in science/math beteween U.S. students and American students.
Staff Development-	Speaker: Lynn Moroney: story teller infusion of science into the curriculum through legends,myths and stories.
Transition Program-	See attachments
Pilot program-	See attachments
Planetarium Activities-	See attachments
Marketing Plan-	See attachments

BEARCAT COMPUTER CONTEST PRESS RELEASE

THE BEARCAT COMPUTER PROBLEM SOLVING CONTEST FOR THE STATE OF MISSOURI WAS HELD SATURDAY, APRIL 27, 1991 AT SOUTHWEST BAPTIST UNIVERSITY IN BOLIVAR, MISSOURI. AFFILIATED WITH THE ICPSC (INTERNATIONAL COMPUTER PROBLEM SOLVING CONTEST) THE CONTEST IS HELD EACH YEAR AND IS OPEN TO VARIOUS GROUPS OF STUDENTS FROM 4TH THROUGH 12TH GRADE. PARTICIPANTS COMPETE AS TEAMS OF 3 IN SEVERAL PROBLEM SOLVING EXERCISES USING THE BASIC OR LOGO COMPUTER LANGUAGE.

TRAVELING FROM KANSAS CITY SCHOOL DISTRICT WERE TEAMS FROM SOUTHWEST SCIENCE MATH MAGNET AND BORDER STAR ELEMENTARY. BOTH TEAMS DID VERY WELL. THE BORDER STAR TEAMS PLACED FIRST AND SECOND IN THE LOGO PROGRAMMING DIVISION FOR 4TH THROUGH 6TH GRADES. TEAM A (1ST PLACE GOLD MEDAL WINNERS) CONSISTED OF JONATHAN RIOS AND JASON BUSH. TEAM B (2ND PLACE SILVER MEDAL WINNERS) WERE AISHA SAFIR AND DAVID WHALEN.

CONGRATULATIONS TO ALL TEAMS FOR A JOB WELL DONE!! THE COACHES WERE FROM SOUTHWEST SCIENCE MATH MAGNET. THE HIGH SCHOOL TEAMS WERE COACHED BY MS. LIZ TAYLOR AND THE ELEMENTARY TEAMS BY MS. TERI KUN:

THE GROUPS ARE LOOKING FORWARD TO IMPROVING THEIR SKILLS AND COMPETING AGAIN NEXT YEAR.

Appendix D
Additional Parent Perceptions

Table D-1
Additional Parent Perceptions
Ratings of Program Aspects

Item Content	Excellent	Good	Average	Fair	Poor
"How would you rate the performance of ..."					
Southwest magnet program	12%	40%	34%	6%	5%
School leadership	17%	24%	21%	5%	6%
Classroom teachers	16%	44%	29%	5%	2%
"What rating would you give to ..."					
Condition of school building	35%	43%	16%	1%	2%
Opportunities for parent involvement	30%	36%	19%	8%	4%
Degree of student safety at school	9%	21%	35%	16%	17%
Opportunities for student to explore different careers	23%	34%	32%	8%	3%

Item Content	Very Well	Fairly Well	Somewhat	Not Very Well
"How well informed do you feel you are about Southwest?"	28%	29%	20%	23%

Note: Based on more grade equivalent scores.

Table D-2
Ways Parents Learned about Southwest High

Source	1988-1989	1989-1990	1990-91
Newspaper	13%	13%	11%
Radio	7%	3%	3%
TV	9%	5%	7%
Child	16%	9%	10%
Friend, relative, or neighbor	23%	8%	24%
School district brochures, newsletters	20%	21%	30%
School employees	-----	58%	4%
Other sources	15%	3%	2%
In Neighborhood[1]	----	---	7%
Previous School[1]	----	---	7%
Work in Distrct[1]	----	---	3%
Child Assigned[1]	----	---	4%

Note: Percentages are rounded to the nearest whole percent. Parents could respond to more than one category.

[1] Categories were not included in 1988-1989 or 1989-1990.

Table D-3

Reasons Parents Chose Southwest High

Reasons	1988-1989	1989-1990	1990-1991
Liked the magnet theme	45%	48%	59%
Neighborhood school	78%	63%	47%
Attended last year	81%	65%	48%
Other children in this school	18%	14%	16%
Other reasons	14%	9%	22%
Child's Choice[1]	----	----	7%
Assigned to SWH[1]	----	----	40%
Reputation[1]	----	----	2%
Child's 2nd Choice[1]	----	----	2%
Curriculum[1]	----	----	2%
Environment of School[1]	----	----	2%

Note: Percentages are rounded to the nearest whole percent. Parents could respond to more than one category.

[1] Categories not included in 1988-1989 or 1989-1990.

The School District of Kansas City, Missouri